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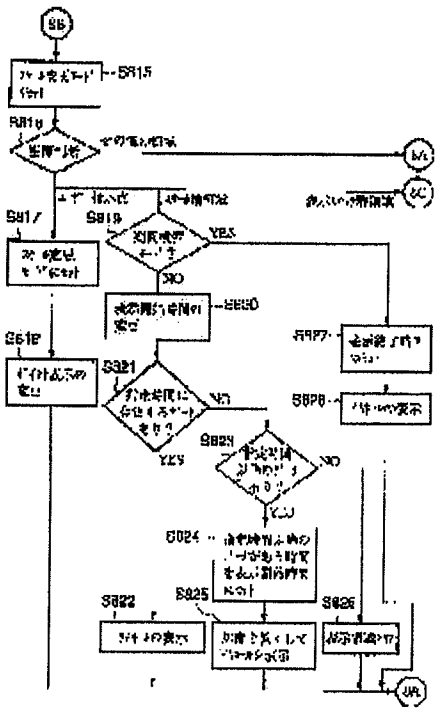
(54) DEVICE AND METHOD FOR RETRIEVING DATA

(57)Abstract:

PROBLEM TO BE SOLVED: To reduce the burden of an operator by identifying the data which are coincident with the designated conditions or the data to be used as candidates.

SOLUTION: When the retrieval conditions including the designated time is set for retrieving the stored data having the added time information, the data are retrieved under the set retrieval conditions. When such data are retrieved, a list of these data is shown in a retrieval result display area (S822). Meanwhile, when those data are not retrieved, the data having the time information that is later than and most approximate to the designated time which is included in the retrieval conditions. Then the time is newly designated according to the time information and the data are retrieved. The retrieved data are shown in a display form that is different from that of the step S822.



* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to data retrieval equipment and a method.
[0002]
[Description of the Prior Art]When data applicable when a search is performed based on the inputted data for search at the time of the data retrieval based on the former, for example, time, did not exist, there is no retrieved data or neighboring data (near in time) was displayed as a candidate.
[0003]
[Problem(s) to be Solved by the Invention]However, in the above-mentioned conventional example, when neighboring data was displayed as a candidate, the operator needed to judge whether it was data which serves as [whether it is data specified by the displayed search results, and] a candidate, and it was inconvenient.
[0004]In light of the above-mentioned problems, this invention indicates whether to be data which serves as [whether it is data corresponding to a designated condition, and] a candidate identifiable, and an object of this invention is to ease an operator's burden.
[0005]
[Means for Solving the Problem]Data retrieval equipment by this invention for attaining the above-mentioned purpose is provided with the following composition. By namely, a search condition set up by setting-out means to be a device with which data stored by adding time information is searched, and to set up a search condition including designated time, and said setting-out means. A 1st search means to search said data, and the 1st displaying means that displays a list of data searched by said 1st search means on a search-results viewing area, A 2nd search means to search data stored by changing designated time included in said search condition, and adding said time information when data searched by said 1st search means did not exist, It has the 2nd displaying means that changes a display style in said search-results viewing area with said 1st search means, and displays data searched by said 2nd search means on it.
[0006]A data retrieval method by this invention for attaining the above-mentioned purpose is provided with the following processes. By namely, a search condition set up at a setting-out process of being a device with which data stored by adding time information is searched, and setting up a search condition including designated time, and said setting-out process. The 1st retrieval process that searches said data, and the 1st display process of displaying a list of data searched by said 1st retrieval process on a search-results viewing area in a display screen, The 2nd retrieval process that searches data stored by changing designated time included in said search condition, and adding said time information when data searched by said 1st retrieval process did not exist, It has the 2nd display process of changing a display style in said search-results viewing area with said 1st retrieval process, and displaying data searched by said 2nd retrieval process on it.
[0007]
[Embodiment of the Invention]Hereafter, the suitable embodiment of this invention is described with reference to an attached drawing.
[0008][A 1st embodiment] Drawing 1 is a block diagram showing the outline composition of the

electronic equipment by a 1st embodiment. In drawing 1, 101 is CPU (central processing unit) and operation of this imaging device is controlled by this CPU101. The data storing part 104 for storing in CPU101 ROM(read-only memory) 102 and RAM(random access memory) 103 which have memorized the control program, and user data, the image processing portion 108, control of a tablet, The tablet control section 109 which detects, the LCD control section 111, shutter SW114, and RTC(real-time clock) 115 are connected, respectively.

[0009]The CCD control section 107 is connected to the image processing portion 108, and CCD106 is connected to the CCD control section 107. The display driving part 112 is connected to the LCD control section 111, and the indicator (although it is considered as a TFT electrochromatic display in this embodiment, not restricted to this) 113 is further connected to the display driving part 112. The handwriting tablet 110 installed on the indicator 113 is connected to the tablet control section 109, and the input to a handwriting tablet is detected.

[0010]CPU101 performs various control based on the control program in ROM102. "This control program The photographing picture signal outputted from the image processing portion 108 is read, The processing which performs a DMA transfer to RAM103", "processing which carries out the DMA transfer of the data from RAM103 to a LCD control section", Processing of "processing which carries out JPEG compression of the image data, and is stored in the data storing part 104 by a file format", the execution of various applications which followed further the information inputted from the "handwriting tablet 110, directions of the photographing operation accompanying operation of shutter SW114, etc." is included.

[0011]RAM103 is provided with the evacuation area 103d, the coordinates storage area 103e, 103 f of flag fields, 103 g of display start time, and 103 h of display end time the work areas 103b, such as the image expansion area 103a and application, VRAM103c, and temporarily.

[0012]The image expansion area 103a as a temporary buffer for storing temporarily the JPEG compression image data read from the taken image (YUV digital signal) sent from the image processing portion 108, or the data storing part 104, It is used as a work area only for a picture for graphical-data-compression processing and thawing treatment. The work area 103b is a work area for various programs. VRAM103c is used as a VRAM which stores the indicative data displayed on the indicator 113. The evacuation area 103d is area for evacuating various data temporarily temporarily. 103e-103h, it is the area which stores the flag used in the application of image restoration, and data, and becomes clear by explanation of the control procedure mentioned later about each contents.

[0013]The data storing part 104 is a memory for storing the photographed image data in which JPEG compression was carried out by CPU101, or the various attached data (picture photographing time etc.) which are referred to from application by the file format, and is constituted from a 1st embodiment by the flash memory. the hour entry which expresses a date and time till a part and a second desirable -- the time -- is added to each image data stored.

[0014]In order that the lens group 105 may project an object image to CCD105 optically, it comprises two or more lenses, and CCD(optoelectric transducer) 106 is an element for changing into an analog electric signal the taken image projected by the lens group 105. A timing generator for the CCD control section 107 to supply a transfer clock signal and shutter signals to CCD106, The circuit for performing noise rejection of a CCD output signal and gain processing, the A/D conversion circuit for changing an analog signal into 10 bit digital signals further, etc. are included. The image processing portion 108 10 bit digital signals outputted from the CCD control section 107 Gamma conversion, Image processing, such as a color space conversion and a white balance, AE, and flash plate amendment, is performed, and 8 bit-digital-signals output of a YUV (4:2:2) format is performed. These lens groups 105, CCD106, the CCD control section 107, and the image processing portion 108 will be doubled, and it will be called the camera module 120 below.

[0015]The tablet control section 109 performs control for changing into a digital signal the variety of information inputted by the drive controlling and pen touch of the handwriting tablet 110, and transmitting to CPU101.

[0016]The YUV digital image data in which the LCD control section 111 was transmitted from the image processing portion 108, Or the YUV digital image data which performed JPEG defrosting to

the graphics file in the data storing part 104 is received, and after changing into an RGB digital signal, processing outputted to the display driving part 112 is performed. The display driving part 112 performs control for driving the indicator 113. The indicator 113 is a display for indication for displaying a picture, and it is a TFT-liquid-crystal display of a VGA standard (640x480 dots) in this example.

[0017]Shutter SW114 is a switch for directing the start of photographing operation. This shutter SW114 has two steps of switch positions according to the holddown pressure of a switch, and it is detection of the 1st step of position (below weak holddown pressure - "half-press position" calls), The locking action of camera settings, such as a white balance and AE, is performed, and incorporation operation of a capture signal is performed by detection of the 2nd step of position (below strong holddown pressure - "shutter-on position" calls).

[0018]Drawing 2 is an outline view of the electronic equipment 201 by a 1st embodiment. In the electronic equipment 201, the handwriting tablet 110 is installed on LCD113 and an operator directs the operation and choosing to wish to the figure and text which were displayed on LCD113 by carrying out depression operation of the display portion corresponding to a desired function by Penn 202 etc.

[0019]Drawing 3 is a lineblock diagram of the handwriting tablet 110. In drawing 3, 301 is a resistance film, and detection terminals are formed in both the right and left ends, and it is connected to the external connection terminal 305c and d. Input coordinate detection of the direction of X is possible for the resistance film 301. Similarly, the resistance film 302 has the external detection terminals 305a and b in top and bottom ends, and input coordinate detection of the direction of Y is possible for it. External connection terminal 305 a-d is a contact button from the resistance films 301 and 302 to the tablet control section 109. Processing of input coordinate detection is explained using the flow chart of drawing 4 below.

[0020]Drawing 4 is a flow chart which shows the coordinates detection processing by a 1st embodiment. The processing shown by drawing 4 is started by interruption. That is, an interrupt occurs for every specified time by the input of the timer built in CPU101, and detection of coordinates is performed. It is judged by Step S401 and 402 whether there is any input which an interrupt generates it is not rich and according to a pen. In Step S401, in order to judge a pen input, the tablet control section 109 is set up. The tablet control section 109 impresses 5V to Y1 (305a), Y2 (305b) is connected to opening (it does not connect anywhere), and it connects X1 (305c) to an A/D converter, and sets up X2 (305d) openly. The change of connection is performed in the circuit constituted by the transistor in the tablet control section 109, etc.

[0021]Next, in Step S402, the A/D conversion of the voltage of X1 is carried out, and a pen input is judged. If the resistance film 301 of the handwriting tablet 110 is pushed with the pen 202 at this time, the point Xp (303) on each resistance film and Yp (304) will contact. Since the voltage of 5V is impressed to Y1 at this time, the potential of 5V is detected through the external terminal X1 (305c) through the point Xp (303) and Yp (304). Since pulldown [of X1] (it connects with GND through resistance) is carried out by the tablet control section 109 when there is no input, 0V is detected. therefore -- if it becomes 0V as a result of the A/D conversion of X1 (305c) -- input nothing -- if it becomes 5V, it will be judged as those with an input. In a actual circuit, since the loss voltage by a noise, and a circuit and wiring resistance occurs, the range is given to the voltage to judge (it is judged as those with an input by more than 4V).

[0022]If a pen input is judged to be nothing at Step S402, it will shift to Step S413. On the other hand, when a pen input is judged [Step S402] to be ****, in order to shift to Step S403 and to perform X coordinate detection, the tablet control section 109 is set up.

[0023]In Step S403, the tablet control section 109 connects to an A/D converter Y1 (305a) shown in drawing 3, and Y2 (305b) connects opening and X1 (305c) to GND, and it impresses 5V to X2 (305d). In the following step S404, the value of an X coordinate is detected by carrying out the A/D conversion of the **** of Y1 (305a). Here, as for the voltage which appears in Y1 (305a), the potential to which X1 (305c) is proportional to the distance from a left end point Xp303 on which the resistance film 301 was pushed since 0V and X2 (305d) were 5V appears. That is, such high voltage is detected that the point of contact Xp goes to right-hand side. The detected voltage changes into

the coordinates corresponding to LCD108. Since the impressed electromotive force is 5V when the total dot number of the direction of X is set to Xdot and the detected pressure value is made conversion on coordinates from voltage with Vx, it is Vx/(5-/Xdot). -- (1)
It is expressed to Mr. **.
[0024]The temporary storage of the data calculated by the above-mentioned formula (1) is carried out to the work area 103b in RAM103. However, when the loss by a circuit, wiring resistance, etc. occurs, it is necessary to substitute the potential difference between X1 and X2 instead of 5V.
[0025]In Step S405 and S406, the same procedure as the detection of an X coordinate mentioned above detects a Y coordinate. At Step S405, setting out of the tablet control section 109 is performed as follows. 5V is impressed to Y1 (305a), Y2 (305b) is connected to GND, X1 (305c) is connected to an A/D converter, and X2 (305d) is made open. In Step S406, it detects by carrying out the A/D conversion of the voltage of X1 (305c). Like Step S404, since the impressed electromotive force is 5V when the total dot number of the direction of Y is set to Ydot and the detected pressure value is made conversion on coordinates from voltage with Vy, it is Vy/(5-/Ydot). -- (2)
It is expressed to Mr. **. The temporary storage of the data calculated by the formula (2) is carried out to the work area 103b in RAM103. However, when the loss by a circuit, wiring resistance, etc. occurs, it is necessary to substitute the potential difference between Y1 and Y2 instead of 5V.
[0026]Next, in Step S407, the existence of a pen input is detected in the same operation as Step S402. When [which removes the chattering at the time of an input, and the influence of a noise etc.] it carries out for accumulating and a pen input is not detected, this treats Step S404 and the coordinates detected by S406 as what was not, and shifts processing to Step S413.
[0027]When a pen input is detected at Step S407, it judges by referring to the continuation flag Xa stored [whether it is a continuation input and] in the work area 103b in RAM103 at Step S408. When the continuation flag Xa is set, it stores in the handwriting tablet detected coordinate storage area 103e in RAM103 by using as continuation input data the coordinates which he followed to Step S409 and were detected, it shifts to Step S410, and the interruption processing concerned is ended. It is judged by each application whether it is coordinate data of the required range, and the stored data performs operation corresponding to each application.
[0028]When the continuation flag Xa is not set at Step S408, the coordinates detected at Step S411 in the detected coordinate storage area 103e are stored, and the continuation flag Xa is set at Step S412.
[0029]If an input is judged to be nothing in Step S402 and the pen input judging of S407, it will be judged whether the continuation flag Xa is set at Step S413. And if the flag Xa is set, in Step S414, the data that Penn 202 was separated from the handwriting tablet 110 will be stored in the detected coordinate storage area 103e, and it will shift to Step S415. In Step S415, a continuation flag is reset and interruption processing is ended at Step S410. The coordinate value in 306 of drawing 3 is set to (0, 0), X and the direction of Y pass, respectively and the coordinate value is made to increase from the point 306 in this embodiment.
[0030]Thus, the processing shown in the flow chart of drawing 4 detects the input to the handwriting tablet 110.
[0031]Drawing 5 is a flow chart for performing the menu indication of this electronic equipment, and selection of each application.
[0032]If a power supply is supplied to this electronic equipment, it will shift to Step S502 from Step S501, and which various clear initial setting of RAM103 will be performed. The menu for choosing applications which this electronic equipment 201 has, such as photography and image restoration, is expressed to the indicator 113 as Step S503. In Step S504, it investigates by judging whether judgment whether there was any input of the application displayed on the indicator 113 by an operator of selection was inputted into new data in the handwriting tablet detected coordinate storage area 103e of RAM103. If there is an operator's input, it will branch to the application selected at Step S505 based on the coordinate data stored in the handwriting tablet detected coordinate storage area 103e.
[0033]That is, if a photographing menu is selected at Step S505, it will shift to Step S506 and a

photographing function will be performed, if image restoration is chosen at Step S505, it will shift to Step S507 and application of image restoration will be performed. If other menus are selected at Step S505, it will shift to Step S508, and application with which a telephone directory, a clock, a schedule, etc. correspond is performed. And after each application is completed, it returns to Step S503 and the display of a menu is performed.

[0034]Next, operation of a photographing function is explained using the flow chart of drawing 6 and drawing 7.

[0035]Drawing 6 is a flow chart which shows the flow of the view finder function in camera photographing operational mode.

[0036]If photographing mode (Step S506) is chosen in the flow chart of above-mentioned drawing 5, it will shift to the processing S601 of drawing 6, i.e., a step. And in Step S602, the CCD module containing CCD106 and the CCD control section 107 is changed into the state (enable) where it can operate. Next, the image incorporated from the camera module by processing after Step S603 is displayed by the indicator 113.

[0037]In Step S603, processing which changes into an electrical signal the light information of the photographic subject incorporated from the camera lens group 105 by CCD106 is performed. This output signal is a non INTARESU analog signal, and in order to gather processing speed, it outputs the data of the reduction size of 320x240dot not by the total pixel of 640x480dot but by infanticide processing. In Step S604, after the signal incorporated at Step S603 passes through the noise rejection processing by the CCD control section 107, gain processing, and the A/D conversion processing to 10 bit digital signals, it is sent to the image processing portion 108.

[0038]In Step S605, the image processing portion 108 processes processing of the amendment at the time of an automatic white balance, AE, and speed light photography, etc., or the signal transformation to a YUV (4:2:2) format. This signal by which YUV conversion was carried out is written in VRAM103c which stores display image data by CPU101, and is regularly outputted to the LCD control section 111 using DMA.

[0039]In Step S606, the LCD control section 111 carries out a conversion process for the received YUV signal to an RGB digital signal, and outputs this RGB code to the display driving part 112 in Step S607. In Step S608, the display driving part 112 performs the display of the object image by the indicator 113 in response to this RGB code.

[0040]As mentioned above, an object image is always monitored on the indicator 113 by carrying out the loop of the processing from Step S603 to Step S608 continuously in the cycle of 1/30 second. Now, when the key operation by a photography person is detected between the loops which are monitoring this image, an interrupt event occurs with a detecting signal and it shifts to the interruption processing shown in drawing 7.

[0041]Drawing 7 is a flow chart which shows the control procedure of the interruption processing by the key operation under camera photographing operation.

[0042]In the stage which this key operation generated, it is in one of the states in two kinds of modes internally. One is the normal mode and it is the mode in which view finder operation explained by drawing 2 is performed continuously. Another is in half-press mode, is in the state where the shutter was once half-pressed and various camera settings were locked, and is the mode in which view finder operation is performed. Drawing 7 is dividing and explaining by two kinds, the processing from the normal mode and the processing from half-press mode of the starting position of processing, of cases.

[0043]Step S701 is key status reading processing for confirming which key operation was made in the interruption processing from the normal mode. When it is detected here that the shutter switch 114 was pushed in Step S702, In Step S703, various camera settings controlled within the image processing portion 108, such as stroboscope amendment in the case of an automatic white balance, AE, and speed light photography, are locked by the current value.

[0044]Now, as explanation of the flow chart of drawing 6 showed, it thinned out in order to raise processing speed in view finder processing, and only incorporation of the signal of the pixel number of a picture was performed, but as a taken image, the full picture of a VGA standard (640x480dot) is required. Therefore, next, in Step S716, the capture signal of a VGA pixel number is incorporated

and the data of a YUV signal is written in the image expansion area 103a in RAM103 after the predetermined processing in the image processing portion 108. This data performs graphical-data-compression processing based on a JPEG standard in Step S717. Then, in Step S718, the selection menu of whether to save the photoed picture as image data belonging to which folder is displayed on the indicator 113.

[0045]In Step S719, if waiting and a folder are chosen until a folder is chosen, compressed data will be written in the data storing part 104 (flash memory) as a graphics file belonging to the folder specified in Step S720. At this time, the thumbnail image which reduced the photographing date obtained by RTC115 and the photoed picture is also written in the data storing part 104 (flash memory) together with image data. Next, in Step S721, after displaying image data on the indicator 113 fixed time so that the photoed picture can be checked, in Step S722, interruption processing is ended, it returns to the loop of drawing 6 again, and view finder processing is resumed.

[0046]Next, when it is detected from key status reading in Step S701 that the shutter half-press switch was pushed (Step S704), In [in Step S705, set internal state setting out as half-press mode first, and] Step S706, Various camera settings in an image processor, such as stroboscope amendment in the case of an automatic white balance, AE, and speed light photography, are locked by the current value like Step S703. After that, in Step S707, interruption processing is ended and it returns to the loop of drawing 6.

[0047]When it is detected that the key for changing a photographing condition from the key status obtained at Step S701 was pressed, It progresses to Step S709 from Step S708, and amendment which doubled with the alteration of condition various camera settings controlled within the image processing portion 108, such as stroboscope amendment in the case of an automatic white balance, AE, and speed light photography, is performed. And it progresses to return processing of Step S707.

[0048]When it is detected that the photography termination key was pressed from the key status obtained at Step S701, it progresses to Step S711 through Step S702, S704, S708, and S710. And operation of display driving is ended first (Step S711), then operation of a CCD module is ended (Step S712), and in Step S713, photographing mode is ended, after performing end processing of other photographing operation.

[0049]When a photography termination key is not detected in Step S710, I hear that an effective key or switch were not detected, and nothing is processed, but it shifts to return processing of Step S707.

[0050]Next, the flow of the interruption processing in half-press mode is explained. When the shutter SW is pushed from half-press mode, it becomes image pick-up processing.

[0051]In Step S714, it is key status reading processing for confirming which key operation was pushed in the interruption processing from half-press mode. When it is detected from the key status read here that the shutter switch was pushed, It progresses to Step S716 from Step S715, and it progresses to execution of the photographing processing (above-mentioned) after Step S716, with the various camera settings (Step S706) in the image processor locked by detection (Step S704) of the former half-press key validated.

[0052]When half-press release is detected from the key status read at Step S714, it progresses to Step S724 from Step S723, and internal state setting out is canceled of half-press mode, and it progresses to return processing of Step S722. When half-press release is not detected in Step S723, I hear that an effective key or switch were not detected, and nothing is processed, but it shifts to return processing of Step S722.

[0053]Next, operation of the application of the image restoration search by this embodiment is explained using the display example of drawing 11 - drawing 17, and the flow chart of drawing 8 - drawing 10.

[0054]Drawing 8 - drawing 10 are flow charts which show the image restoration retrieval processing in a 1st embodiment. If the application (Step S507) of image restoration is chosen in the menu selection of drawing 5, processing will shift to Step S801. First, in Step S802, it is chosen using which mode of the two display modes which this apparatus has the picture stored is displayed. If the mode flag stored in 103 f of flag fields is set to the folder display mode (let an initial value be a

folder display mode), processing will shift to Step S803 and the application of a folder management display will operate.

[0055]Drawing 11 is a figure showing the display example in a folder management display mode. In this display mode, each picture belongs to one of folders (group), respectively, and is managed. The display screen shown in drawing 11 is displayed on the indicator 113. The folder registered is displayed on the field 1101. The list display of the thumbnail image of the picture belonging to the folder chosen as the field 1102 is carried out to the field of (1) - (12). When there are many pictures belonging to an applicable folder, a thumbnail image can scroll by operation of the scroll bar of 1103, and all the pictures can be displayed. Here, selection of one of the thumbnail images currently displayed on the field 1102 will carry out the full-screen display of the picture corresponding to the thumbnail image concerned to the indicator 113.

[0056]Execution of desired processing, etc. can be directed by displaying a feature button on the field 1104 and directing the displayed feature button by Penn etc. That is, the feature button selected through the handwriting tablet 110 is detected, and operation to which a mode change, deletion of a picture, etc. correspond is performed. If the end of application is chosen, it will shift to Step S804, and reproductive application is ended, and processing is returned to the menu indication of Step S503 of the flow chart of drawing 5.

[0057]On the other hand, in Step S802, a set of the time series display mode will perform the **** display shown in drawing 12 based on the time information (photographing date) which the stored image data has to the indicator 113 in Step S805. Drawing 12 is a figure showing the display example in a time series display mode.

[0058]In drawing 12, the field 1106 surrounded by the dotted line is time-axis display area, 1106b in this area expresses a time-axis, and above aims to go back in time (past). The temporal data of a bigger unit than the time basis displayed on 1106-d fields, such as a year and the moon, is displayed on the field of 1106a. 1106 d of temporal data (at the moon, a day, the time part) etc. of the minimum unit which can be displayed are displayed. 1106c is a point which shows the time specified by an operator now, reads the thumbnail image of the image data of the time (or it or subsequent ones) set up by the designated point 1106c by an operator from the data storing part 104, and displays it on the thumbnail image viewing area 1102. There is much image data of the set-up time, and when it cannot display at once, all the thumbnail images are displayed by operating the scroll bar 1103 (1103a, 1103b). The time specified by the designated point 1106c is displayed on the field of 1105. 1104 performs each operation which corresponded when directed with the pen 202 in the field in which each switch, such as change in the mode and deletion of a picture, is displayed.

[0059]In Step S806, it judges by referring to whether the pen input occurred and whether coordinates were newly stored in the detected coordinate storage area 103e, and processing of Step S806 is repeated until there is an input. If a pen input occurs, a pen updater is judged at Step S807, and in being a pen updater, in Step S808, the scale change mode flag in the flag field 103f of RAM103 will be reset, and it will return processing to Step S806.

[0060]In not being a pen updater at Step S807, When it is a continuation input, namely, when it judges whether it is a continuation input at Step S809, and the handwriting tablet 110 is continuing being pushed by Penn 202, With reference to the scale change mode flag in the flag field 103f, it judges whether the present mode is scale maintenance mode at Step S810, and in not being scale maintenance mode, it returns processing to Step S806.

[0061]In being scale maintenance mode, in Step S811, the inputted X coordinate "Xp" of coordinates (Xp, Yp) shifts processing to Step S806 at Step S812, when not equal, return and, when equal to the designated point 1106c. And in Step S812, in being "Xup<Xp", it deals with expansion of a scale at Step S813, and in being "Xup>Xp", it processes scale reduction at Step S814. That is, if Penn 202 is moved to right-hand side in a continuation input, a scale will be expanded, and reduction of a scale will be processed if Penn 202 is moved to left-hand side.

[0062]Drawing 13 to drawing 16 is a figure showing the display example of the time-axis display area in scale maintenance mode. In processing of the scale expansion of Step S813, if an operator directs expansion continuously, the scale of a time-axis will be expanded gradually. For example, as shown in drawing 14 from drawing 13, the scale of a time-axis changes. At this time, the display

position of the designated point 1106c and designated time remain as it is, and the time display unit on the right-hand side of the time-axis 1106b is changed from a month unit to a Japanese unit, and shows years in the field of 1106a. Here, the stage of a scale expansion assumes that it is changing gradually with the week unit, the two-day unit, and the Japanese unit.

[0063]On the other hand, in processing of scale reduction of Step S814, as shown in drawing 15 or drawing 16 from drawing 13, a display changes, and the display position of the designated point 1106c and designated time remain as it is, and change the time display unit on the right-hand side of the time-axis 1106b from a month unit to a unit and also a year unit every two months. After processing of Step S813 and S814 is completed, processing is shifted to Step S806, respectively. Here, if the input of the pen 202 continues further, expansion of a scale and processing of reduction will be performed further.

[0064]Since a pen updater will be stored in the detected coordinate storage area 103e and the scale change mode flag 103d will be reset at Step S808 if the pen 202 is detached, a change of a scale is made only when inputted continuously. Drawing 14, and 15 and 16 are stages in the middle of scale change, respectively, and expansion and processing of reduction change to the maximum unit and the minimum unit which were set up until an operator's directions were lost. Here, the mode in which the minimum time unit of the above-mentioned search is specified like a month unit and a Japanese unit may be formed so that the minimum unit which an operator desires can be set up.

[0065]In not being a continuation input at Step S809, the scale change mode flag in the flag field 103f of RAM103 is reset at Step S815, and it shifts to Step S816 and judges the coordinates by which the pen input was carried out.

[0066]When the coordinates inputted in Step S816 are designated point 1106c fields (coordinates (Xup, Yup)), In order to set the scale change mode flag in the flag field 103f at Step S817 and to tell an operator about change in the mode at Step S818, as shown in drawing 13, the display of the designated point 1106c is changed and processing is returned to S806.

[0067]If the coordinates inputted in Step S816 are the fields of the time-axis 1106b except the field of the designated point 1106c, it will progress to Step S819 and will judge with reference to the period search mode flag in the flag field 103f for whether it is period search mode. Here, period search mode is the mode in which the data retrieval display of the period set up like XX year XX moon XX Japan - OO year OO moon OO Japan is performed. The designated point of 1106c is moved to the place corresponding to the coordinates detected by shifting to Step S820 at Step S819 when it was not period search mode, and the time corresponding to the detected coordinates is stored in 103 g of display-start-time fields of RAM103.

[0068]Next, whether image data with the temporal data which agrees in Step S821 in the temporal data stored in 103 g of display-start-time fields exists. When the temporal data of the picture stored in the data storing part 104 is searched, it judges and applicable image data exists, it shifts to Step S822 and the thumbnail image of applicable image data is displayed on the viewing area 1102. At this time, the time to the minimum unit of the specified time shall be compared at Step S821. For example, when November 2, 1998 is specified, the thumbnail image which has the time information by 0:0 0 second - on November 2, 1998, and 23:59 59 seconds is displayed. And after the end of display processing, processing is returned to Step S806.

[0069]On the other hand, in Step S821, when applicable image data does not exist, it is searched whether a picture with the temporal data after the time specified at Step S823 exists. When image data applicable in this search does not exist, the thumbnail image viewing area 1102 is cleared at Step S826, and processing is returned to Step S806.

[0070]In Step S823, when a picture with the temporal data after the specified time exists, the temporal data nearest to the specified time concerned is set to 103 g of display-start-time fields henceforth [the time specified by progressing to Step S824]. And in Step S825, the luminance data of a thumbnail image is made low, a thumbnail image is displayed on the viewing area 1102 (drawing 17), and processing is returned to Step S806.

[0071]Drawing 17 is a figure showing the state where made luminance data low and the thumbnail image was displayed. Thus, it can tell intuitively that the image data corresponding to the time specified by an operator did not exist by making low the luminance data of the thumbnail image in

the viewing area 1102.
[0072]It may be made to specify to an operator that the image data corresponding to the date exists by changing the display style of the area where image data corresponding among 1106 d (at the moon, a day, the time part etc.) of unit display area of the time-axis display area 1106 exists. For example, according to the display example shown in drawing 17, the date of 02 and 06 makes it dark, and is displayed, and it is shown that the image data which has temporal data on the 2nd and the 6th exists.
[0073]Now, when period search mode is set at Step S819, in Step S827, by making specified time into display end time, it saves to 103 h of display end time fields of RAM103, and the stored time is displayed on the viewing area 1107. The thumbnail image of the image data which exists between the time set as 103g of display-start-time fields set by processing of Step S831 later mentioned in Step S828 and 103 h of display end time fields is displayed on the viewing area 1102, and processing is shifted to Step S806.
[0074]If the switch region 1104 is chosen at Step S816, it will shift to Step S829. If the field of the feature button "period" of the switch region 1104 is specified here, processing will progress to Step S830 from Step S829. In Step S830, the period search mode flag of 103 f of flag fields in RAM103 is set. And at Step S831, it stores in 103 g of display-start-time fields as time of onset of period search of the time specified in the designated point of 1106c now, the stored time is displayed on the viewing area 1105, and processing is shifted to Step S806.
[0075]In not being a period search mode field at Step S829, In [if processing is shifted to Step S832 and the release field of the period search mode of the switch regions 1104 is specified, will reset a period search mode flag at Step S833, and] Step S834, Display start time is changed at the time specified in the designated point of 1106c now.
[0076]In not being a release field of period search mode at Step S832, In Step S835, judge whether the field of the folder management display mode is specified, and in being a field of a folder management display mode, In Step S836, the mode flag in the flag field 103f of RAM103 is set to a folder management display mode, and processing is moved to Step S802.
[0077]When the field of the folder management display mode is specified at Step S835 and there is nothing, processing is moved to Step S837, processing corresponding to other switches (deletion, a menu change, etc.) is performed, and processing is moved to Step S806.
[0078]When other fields are inputted at Step S814, nothing is processed but it returns to Step S806.
[0079]Like the display example of drawing 18, it is also possible to realize time search mode and folder search mode simultaneously. In this case, the thumbnail image of the picture which belongs to the selected folder by the folder which displayed the folder which has the image data of the time range specified by the time-axis in the field 1401 shown by the dotted line on the field 1402, and was displayed on the field 1402 is displayed on the field of 1403. In drawing 18, after choosing a folder, it is clear that it may be made to specify a time range.
[0080]As explained above, when the picture which has a hour entry of the specified time (date) does not exist according to a 1st embodiment, Report that a picture does not exist in the time which made luminosity low, carried out the list display to the field 1102 of the indicator, and specified the thumbnail image of the picture which has the nearest hour entry after the specified time as the operator, and. Since search results can be easily judged since the picture of near time was displayed when the specified time was not exact, or even when misapprehension is carried out, the image data for which it asks can be searched quickly.
[0081]What is necessary is to just be displayed so that distinction of whether to be a picture applicable to the time specified in short may stick although luminosity of the picture was made low and the thumbnail image of the image data after the specified time was displayed in the display example of drawing 17. Therefore, the gestalt of the frame, for example surrounding a thumbnail image like the display example of drawing 19 is changed into a dotted line, and it may be made to display it.
[0082][A 2nd embodiment] In a 1st embodiment, when the picture which has a hour entry of the specified time (date) did not exist, luminosity was made low and the list display of the thumbnail

image of the picture which has the nearest hour entry after the specified time was carried out to the field 1102 of the indicator. The specified time (date) order is searched with a 2nd embodiment, and the data of the nearer one is displayed.

[0083]Hereafter, operation of the electronic equipment by a 2nd embodiment is explained using the flow chart of drawing 20. A 2nd embodiment transposes the procedure of Steps S823-S826 (drawing 9) of a 1st embodiment to the procedure shown in the flow chart of drawing 20.

[0084]When the picture of designated time does not exist at Step S821, the picture which shifts to Step S1601 of drawing 20, and has temporal data after the specified time exists, or the inside of the data storing part 104 is searched. When the picture after the specified time exists, the temporary storage of the temporal data Ta of a picture which has the nearest temporal data henceforth [the time specified at Step S1602] is carried out to the work area field 103b, and it shifts to Step S1603. On the other hand, in Step S1601, when applicable image data does not exist, nothing is done but it shifts to Step S1603.

[0085]The picture which has temporal data before the specified time exists, or the inside of the data storing part 104 is searched with Step S1603. When the image data before the specified time exists, in Step S1604, the temporary storage of the temporal data Tb of a picture which has the nearest temporal data before [the specified time] is carried out to the work area field 103b, and it shifts to Step S1605. In Step S1605, if it checks whether the value is stored in Ta and Ta is stored, when it shifts to Step S1606 and the value is not stored in Ta, it shifts to Step S1607.

[0086]At Step S1606, it is a following formula "Ta-T>=T-Tb."
It is alike and it is judged whether it is the time near the time which which of Ta and Tb specified to the specified time T more. Since it is close to the time specified by the direction of Tb when "Ta-T>=T-Tb" is materialized, it shifts to Step S1607 and Tb is set to display start time. And luminosity is made low, a thumbnail image corresponding from the picture which has temporal data of Tb is expressed as Step S1608, and processing is returned to Step S806.

[0087]On the other hand, since the direction of Ta is near time when it is "Ta-T<T-Tb" at Step S1606, Ta is set to display start time at Step S1610. And luminosity is made low, a thumbnail image corresponding from the picture which has temporal data of Ta is expressed as Step S1608, and processing is returned to Step S806.

[0088]In Step S1603, when the picture which has temporal data before the specified time does not exist, it shifts to Step S1609 and it is checked whether the value is stored in Ta. If the value is stored in Ta, since it exists (only in case of data after designated time), only Ta will shift to Step S1610. Since there will be no image data before and behind designated time on the other hand when the value is not stored in Ta, after clearing a viewing area at Step S1611, processing is returned to Step S806.

[0089]Since it becomes possible to search the specified time (date) order and to display the data of the nearer one according to a 2nd embodiment as explained above, even when the operator has misunderstood in and time is specified, the data near the data for which it asks more can be displayed.

[0090][A 3rd embodiment] The specified time (date) order was searched with a 2nd embodiment, and the data of the direction near the specified time was displayed by a different display style from the data which has a hour entry of designated time. At a 3rd embodiment, a display style is changed by the picture which has temporal data before the specified time, and the picture which has next temporal data.

[0091]Hereafter, operation of the electronic equipment of a 3rd embodiment is explained using the flow chart of drawing 21, and the display example of drawing 22. Processing of a 3rd embodiment is transposed to the procedure which shows the procedure of Steps S823-S826 (drawing 9) of a 1st embodiment in the flow chart of drawing 21.

[0092]When the picture of designated time does not exist at Step S821 of drawing 9, the picture which shifts to Step S1701 of drawing 21, and has temporal data after the specified time exists, or the inside of the data storing part 104 is searched. When the picture which has temporal data after the specified time exists, the temporary storage of the temporal data Ta of a picture which has the nearest temporal data henceforth [the time specified at Step S1702] is carried out to the work

area field 103b, and it shifts to Step S1703. In Step S1701, when the data after the specified time does not exist, nothing is done but it shifts to Step S1703.
[0093]In the picture which has temporal data before the specified time in Step S1703 existing, or searching the inside of the data storing part 104 and existing, In Step S1704, the temporary storage of the temporal data Tb of a picture which has the nearest temporal data before [the specified time] is carried out to the work area field 103b, and it shifts to Step S1705. In Step S1705, it is checked whether the value is stored in Ta. Here, if Ta is stored, in order to compare the size of Ta and Tb, it shifts to Step S1706. When the value is not stored in Ta, it shifts to Step S1707.
[0094]In Step S1706, it is judged whether it is close to the time which which of Ta and Tb specified to the specified time T by following formula Ta-T>=T-Tb. Since the direction of Tb is near time when "Ta-T>=T-Tb" is materialized, it shifts to Step S1707 and Tb is set to display start time. And luminosity is made low and a thumbnail image corresponding from the picture which has temporal data of Tb is expressed to the thumbnail image viewing area 1102 of drawing 22 as Step S1708 (display style B). In the display example of drawing 22, the thumbnail image is displayed on the field of (1) - (7) of the thumbnail image viewing area 1102 according to the display style B. Then, processing is moved to Step S1709.
[0095]Since the direction of Ta is near time when it is "Ta-T<T-Tb" at Step S1706, Ta is set to display start time at Step S1715. And luminosity is made low and a thumbnail image corresponding from the picture which has temporal data of Ta is expressed to the thumbnail image viewing area 1102 of drawing 22 as Step S1716 (display style A). Here, in the display style A and the display style B, the rate that are changing the rate which makes luminosity low and the direction of the display style B makes luminosity low in this embodiment is made high. Processing is moved to Step S1709 after the end of display processing of Step S1716.
[0096]When the picture which has temporal data before the specified time in Step S1703 does not exist, If it shifts to Step S1714, it checks whether the value is stored in Ta and the value is stored in Ta, when it shifts to Step S1715 and the value is not stored in Ta, processing is returned to Step S806.
[0097]It displays by searching a picture until all the fields are buried with the processing after Step S1709, when an opening is shown in the thumbnail image viewing area of (1) - (12) of the image display region 1102. It can be expressed whether it is order to the time which the display style was changed also at this time (display style A or B), and specified it as the operator intuitively before and behind the specified time.
[0098]After finishing [Step S1709] the display of the thumbnail of the direction near designated time as mentioned above, when it judges whether free space is shown in the viewing area 1102 and there is an opening, When it shifts to Step S1710 and there is no opening, thumbnail image display processing is ended and it returns to Step S806.
[0099]When it displays at Step S1708, in Step S1710 Designated time or subsequent ones. Whether the image data which has temporal data before designated time when it displays at Step S1716 exists, and in searching and existing, if processing is not shifted and existed in Step S1711, it returns to Step S806.
[0100]In Step S1711, ******** [before the time when the hour entry of the image data searched with Step S1710 was specified] is judged, and if it is before, a thumbnail image corresponding at Step S1712 will be displayed on the free space of the field of 1102 according to the display style B in order. On the other hand, when it is judged at Step S1711 that it is not before the specified time, a thumbnail image corresponding in Step S1713 is displayed on the free space of the field 1102 by the display style A in order. After Step S1712 and processing of S1713, repeat execution of the processing of Steps S1709-S1713 is carried out until the opening of the viewing area of 1102 is lost or image data is lost.
[0101]By the above processing, a display is made, for example like drawing 22. In the display example of drawing 22, the field of (1) - (7) is the display style B, the field of (8) - (12) is the display style A, and the thumbnail image display by the display style A and the display style B is changed (the luminosity of a picture is changed).
[0102]As mentioned above, since according to a 3rd embodiment a display style is changed and it

displays in the case of the picture which has data of the time before the specified time, and the picture which has data of next time, it can be checked which data before and behind the time specified intuitively it is.

[0103][A 4th embodiment] At a 3rd embodiment, when the image data which has temporal data of the specified time did not exist, by the picture which has temporal data before the specified time, and the picture which has next temporal data, the display style was changed and it displayed. According to a 4th embodiment, the field which displays the picture corresponding to the time specified as the thumbnail image indicator 1102 and the picture before and behind that is always provided.

[0104]Drawing 23 is a figure showing the display example of the image data based on a 4th embodiment. In drawing 23, the thumbnail image of the picture which has temporal data of designated time is displayed on the center section ((1) - (9)) of the thumbnail image viewing area 1102. To designated time, the size of a thumbnail image is reduced to near order, and the thumbnail image of the picture which has temporal data before designated time is displayed on it in the upper part (B-(1) -B-(5)) of the thumbnail image indicator 1102. To designated time, the size of a thumbnail image is reduced to near order, and the thumbnail image of the picture which has temporal data after designated time is displayed on the lower part (A-(1) -A-(5)) of the thumbnail image indicator 1102. Here, when the data of the specified time does not exist, nothing shall be displayed on the thumbnail image viewing area of (1) - (9).

[0105]Since the thumbnail image of the picture which always has temporal data of order to designated time is displayed according to a 4th embodiment, a relation with the picture of order always becomes clear to the specified time, and when has misunderstood and time is specified, desired data can be looked for quickly.

[0106][A 5th embodiment] Next, a 5th embodiment is described. According to a 1st embodiment, the display of all the thumbnails of the image data belonging to the time specified by operation of the scroll bar was enabled. According to a 5th embodiment, it uses that the image data before and behind designated time can also be displayed by scroll operation.

[0107]Since the main composition of the electronic equipment in a 5th embodiment, coordinates detection processing, etc. are the same as that of a 1st embodiment, explanation is omitted.

[0108]Drawing 24 is an outline view of electronic equipment 201' by a 5th embodiment. The same reference number is given to the same composition as a 1st embodiment (drawing 2). Differing from drawing 2 is the point of having formed the dial 115. By directing scroll operation etc. and rotating the dial 115, a pulse signal occurs and the dial 115 generates interruption to CPU101. If an interrupt occurs, CPU101 detects the hand of cut of the dial 115, and saves dial input data in the RAM103 work area 103b. This saved data is referred by each application and operation of scrolling etc. is performed.

[0109]Next, with reference to drawing 25 - drawing 28, that of operation of the image retrieval and reproduction by a 5th embodiment is explained. In drawing 25 - drawing 28, the same step number is given to the same processing step (drawing 8 - drawing 10) as a 1st embodiment. Also in a 5th embodiment, a display is obtained by the same processing as a 1st embodiment explained at the time shown in drawing 11.

[0110]In Step S806 judged by referring to whether the pen input occurred and whether coordinates were newly stored in the detected coordinate storage area 103e, different processing from a 1st embodiment is processing when a pen input is not detected. In this case, processing progresses to Step S1815, when it judges whether there was any input of the dial 115 and there is no input, returns processing to Step S806, and repeats processing of Step S806 and S1815. In this way, if detection of an input of a pen and a dial is repeated and the input of the dial 115 is detected, processing will be moved to Step S1831 of drawing 27.

[0111]In the coordinates judgment in Step S816, the processing which judges whether the scroll area (1103a, 1103b in the field 1103 of drawing 11) was directed is added, and when a scroll area is directed, it advances to Step S1831 of drawing 27.

[0112]In Step S1831, it is judged whether the field (1103a) which directs the upper scroll operation in the scroll bar 1103 was chosen, or upper scrolling was directed by the dial 115. When upper

scrolling is directed, it progresses to Step S1832 from Step S1831, and the temporal data which the image data displayed on the image data (the example of drawing 12 (4) of the field 1102) of the head of the 2nd row of the thumbnail displayed now has is set to display start time. It is because the 2nd row turns into a head sequence by scrolling. And in Step S1833, the image data applicable to the newly set-up time is searched, and it displays on the field 1102. Here, the search time range of image data is made into 24 hours from the temporal data which (4) of the field 1102 has. For example, if display start time is 18:15 25 seconds on November 2, 1998, the image data by 18:15 24 seconds on November 3, 1998 will be searched and displayed.

[0113]When there is no picture displayed at the head of the 2nd row, from the display start time set up now, the image data which has subsequent temporal data is searched, and the thing near the most present display start time is set as new display start time.

[0114]When scrolling which the lower scroll area (1103b) in the scroll bar 1103 was chosen, or was carried out by the dial 115 is directed, processing progresses to Step S1835 through Step S1831 and S1834. In Step S1835, judge whether it pointed to the lower scroll instruction field (1103b), and in being an indication area of lower scrolling, Image data with the temporal data before the picture made into the present display start time is searched with Step S1835, Redisplay of the thumbnail is carried out to the field of 1102 from the display start time which set to display start time the time when the image data located before a single-tier part (three pictures) had when image data was arranged in a time series, and was set in Step S1834. When there is no picture of the front for a single tier, redisplay of the thumbnail is carried out to the field of 1102 from the display start time which set to display start time 1 or the time when the image data in front of 2 pictures had, and was set at Step S1833.

[0115]In the thumbnail indication by the above-mentioned step S1833, it confirms whether be the image data which does not correspond to the display start time set up first, and if it is the image data not corresponding, luminosity of a picture will be made low and will be displayed.

[0116]In Step S1834, in not being a lower scroll instruction field, it returns processing to S806, without doing anything.

[0117]A judgment of upper scrolling based on the input of the dial 115 and lower scrolling is made by whether the dial was rotated in the direction of the back, or it was made to rotate in the direction of this side, and the corresponding scroll process is performed.

[0118]the effect which is acquired by a 1st embodiment according to a 5th embodiment as explained above -- in addition, only by operating the dial 115 and the scroll area 1103, it becomes possible to see easily the picture before and behind the specified display start time, and operativity improves. Also in the screen after scrolling, the luminosity of the thumbnail of candidate data is lowered and displayed rather than the luminosity of the thumbnail of the searched data (display ******** explained at the above-mentioned step S1833).

[0119]Also in a 5th embodiment, it is clear for a variation which was explained using drawing 17 - drawing 19 in a 1st embodiment to be possible.

[0120][A 6th embodiment] In a 5th embodiment of the above, when the picture which has a hour entry of the specified time (date) did not exist, luminosity was made low and the list display of the thumbnail image of the picture which has the nearest hour entry after the specified time was carried out to the field 1102 of the indicator. The specified time (date) order is searched with a 6th embodiment, and the data of the nearer one is displayed.

[0121]Hereafter, operation of the electronic equipment by a 6th embodiment is explained using the flow chart of drawing 29. A 6th embodiment transposes the procedure of Steps S823-S826 (drawing 26) of a 5th embodiment to the procedure shown in the flow chart of drawing 29.

[0122]When the picture of designated time does not exist at Step S822, it shifts to Step S1901 of drawing 29, and an initial value is substituted for each variable used by future processings. Here, the initial value of the variable C is 0 at a counter. Used since the temporal data which the other variables Ta and Tb, **, and image data have is saved temporarily, an initial value is 0. Here, designated time is stored in Ta' and Tb'. As for each variable, a field is secured into the work area 103b in RAM103.

[0123]Next. [whether the picture (picture photoed after designated time) which has temporal data

after the time stored in Ta' at Step S1902 exists, and] When the inside of the data storing part 104 is searched and a picture exists, the temporal data of the picture which has the nearest temporal data is substituted henceforth [the time stored in Ta' at Step S1903] at Ta, and it shifts to Step S1904. In Step S1902, when the picture which has temporal data after the time stored in Ta' does not exist, nothing is done but it shifts to Step S1904.

[0124]In [when the picture (picture photoed before designated time) which has temporal data before the time stored in Tb' in Step S1904 exists, or the inside of the data storing part 104 is searched and it exists] Step S1905, From the time stored in Tb', variable Tb storing of the temporal data of the picture which has the nearest temporal data before is carried out, and it shifts to Step S1906. In Step S1906, if it checks whether the value is stored in Ta and the value is stored, when it shifts to Step S1907 and the value is not stored in Ta, it shifts to Step S1908.

[0125]At Step S1906, they are a following formula and "Ta-T>=T-Tb."

When one of Ta and Tb judges whether it is near time to the time T which was alike and was specified more and "Ta-T>=T-Tb" is materialized, it shifts to Step S1908. In Step S1908, since the temporal data **** picture stored in Tb is closer to designated time, the value of Tb is stored in variable Tb' and it shifts to Step S1909.

[0126]At Step S1907, since the direction of Ta is a near stage when it is "Ta-T<T-Tb", Ta is stored in Ta' at Step S1915, and it shifts to Step S1909. In Step S1904, when the picture which has temporal data before the specified time does not exist, it shifts to Step S1914, it checks whether the value is stored in Ta, and if the value is stored in Ta, it will shift to Step S1915. On the other hand, when the value is not stored in Ta at Step S1914, processing is moved to Step S1909. In Step S1909, the value of a counter is **********ed and it compares whether the value of C is 12 at Step S1910, in being "C!=12", it moves processing to Step S1918, and Ta and Tb are initialized, and processing is returned to Step S1902. Thus, processing of Steps S1902-S1910, S1914, S1915, and S1918 is repeated by thumbnail indication possible number of sheets (this embodiment 12 sheets). Except for the once selected picture (Step S1908, picture which stored temporal data in the variable by S1615), it shall refer to processing of Step S1903 and Step S1905.

[0127]In being "C= 12" at Step S1910, When it judges whether temporal data other than the temporal data of the designated time which is an initial value is stored in Tb' and temporal data is not stored in Tb' at Step S1911, it shifts to Step S1916, and when temporal data exists in Tb', it shifts to Step S1912. A thumbnail image is expressed as Step S1912 from the picture which sets Tb' to display start time and has temporal data of Tb' at Step S1913.

[0128]Next, in Step S1916, it is judged whether temporal data other than the temporal data of the designated time which is an initial value is stored in Ta', So that the picture which has temporal data of Ta' may be displayed on (12) of the thumbnail indication area 1102, The image data which has new temporal data by 12 sheets from the picture which has temporal data of Ta' is searched, this temporal data is set to display start time, and a thumbnail image is expressed as Step S1913. When temporal data is not stored in Ta' at Step S1916, it is that image data is not stored, and nothing is done but processing is returned.

[0129]When the specified time (date) order was searched with a 6th embodiment, it becomes possible to display the image data near designated time, the operator has misunderstood in and time is specified by the procedure explained above, the data near the data for which it asks more can be displayed.

[0130][A 7th embodiment] The specified time (date) order was searched with a 6th embodiment, the display style was usually changed with the time and the data of the nearer one was displayed. According to a 7th embodiment, it is with the case of the picture which has temporal data before the specified time, and the picture which has next temporal data, and also a display style is changed and it displays. In processing of Step S1913 of drawing 29 of a 6th embodiment, this can be realized, when displaying a thumbnail, and the temporal data which the image data corresponding to a thumbnail has changes the display style of a thumbnail image in a front [designated time] or the back.

[0131]Drawing 22 is a display example of this embodiment, and displays by image data older than designated time and new image data by changing the rate which makes luminosity low. In drawing 22,

(1) - (7) of the thumbnail image viewing area 1102, It is a picture which has temporal data older than designated time, and (8) - (12) is a picture which has temporal data newer than designated time, more, it makes luminosity low and shows the picture which has temporal data older than the picture which has new temporal data.

[0132]As mentioned above, in a 7th embodiment, since a display style is changed and a thumbnail image is displayed in the case of the picture which has data of the last time, and the picture which has data of next time, it can be intuitively checked whether it is old or new to the time specified by the displayed picture. Although the display style was changed by whether it is older than the specified search time or new in a 7th embodiment, it is effective even if it changes a display style further by whether it is the search time specified by the temporal data which image data has, and how much separated.

[0133][An 8th embodiment] in the electronic equipment by a 5th embodiment. When the picture which has a hour entry of the specified time (date) did not exist, luminosity of the thumbnail image of the picture which has the nearest hour entry after the specified time was made low, and the list display was carried out to the field of the thumbnail indication field 1102 of the indicator 113. On the other hand, in an 8th embodiment, when the picture which has a hour entry of the specified time (date) exists and display area remains in the field of the thumbnail indication field 1102, luminosity of the thumbnail image of the picture of the time near the time specified as the remaining fields is made low, and is displayed.

[0134]Operation of this embodiment is realized by adding change which shows drawing 26 of a 5th embodiment, and the flow chart of drawing 27 to the flow chart of drawing 30 and drawing 31. Drawing 32 and drawing 33 are the display examples of this embodiment.

[0135]In the flow chart of drawing 30, the same step number is attached about the step shown in drawing 26, and the step which performs the same processing.

[0136]In Step S822, after carrying out the thumbnail indication of the picture which has temporal data applicable to designated time, it is judged at Step S2001 whether thumbnail indication area still remains in the thumbnail indication field 1102. When thumbnail indication area does not remain, processing is returned to Step S806, and when thumbnail indication area remains, it progresses to Step S2002.

[0137]The image data which has temporal data after designated time exists, or the inside of the data storing part 104 is searched with Step S2002, and when the image data which has temporal data after designated time does not exist, processing is returned to S806. On the other hand, when the image data which has temporal data after designated time exists, the thumbnail of a picture which has temporal data after designated time is expressed to the remaining display area of the thumbnail indication area 1102 as Step S2003.

[0138]Drawing 32 is a display example at this time, and the field of (1) - (8) of the thumbnail indication area 1102 makes low luminosity of the thumbnail of the picture applicable to designated time, and shows it.

[0139]The flow chart of drawing 31 is a flow chart which shows the flow of the scroll operation of an 8th embodiment, is transposed to processing of Steps S1831-S1835 of drawing 27 of a 5th embodiment, and is performed. At Step S1901, a scroll area will judge whether the thumbnail image to which it is indicated by the thumbnail image with low-intensity at Step S2101 exists, if directions or the input of the dial 115 occurs. That is, when it judges whether the thumbnail indication of the image data which does not agree in designated time occurs and there is no low-intensity thumbnail image display, processing is moved to Step S1831. Step S1831 - processing of 1835 are the same as that of Steps S831-S835 of drawing 27.

[0140]When there is a low-intensity thumbnail image display at Step S2101, When it shifts to Step S2102, it judges whether upper scrolling was directed like Step S1903 and upper scrolling is directed, All the thumbnail images currently displayed with the present low-intensity one are replaced and expressed to the thumbnail of a picture which has temporal data new next as Step S1909. That is, in the display example shown in drawing 32, the thumbnail of a picture which has new temporal data is displayed on the next of the thumbnail image currently displayed on the field of (12) in an order from (9). At this time, as shown in drawing 32, a scroll area is specified to an

operator by surrounding the periphery of the thumbnail indication area of (9) - (12) with the linea nigra. An end of processing of Step S2103 will return processing to Step S8066.
[0141]When upper scrolling is not directed at Step S2102, all the thumbnail images currently displayed with the present low-intensity one are replaced and expressed to the thumbnail of a picture which has temporal data old next as Step S2104 contrary to Step S2103, and it returns to Step S806. Also when lower scrolling is directed at Step S2104 and there is nothing, processing is returned to Step S806.
[0142]With the flow chart shown in drawing 31, since only the thumbnail of the image data of the search condition (designated time) neighborhood can be checked by scrolling, the relation of the picture before and behind a search condition can be grasped easily.
[0143]By explained operation, above in an 8th embodiment. When the picture which shakes the hour entry of the specified time (date) exists and display area remains in the field of the thumbnail indication field 1102, the thumbnail image of the picture of the time near the time specified as the remaining fields can be changed and displayed for a display style.
[0144]Although the above made image data the retrieval object, it is not restricted to this. In other than image data, the list display of search results may be made to carry out the list display of the file name.
[0145]Even if it applies this invention to the system which comprises two or more apparatus (for example, a host computer, an interface device, a reader, a printer, etc.), it may be applied to the devices (for example, a copying machine, a facsimile machine, etc.) which consist of one apparatus.
[0146]The purpose of this invention the storage (or recording medium) which recorded the program code of the software which realizes the function of an embodiment mentioned above, It cannot be overemphasized that it is attained, also when a system or a device is supplied and the computer (or CPU and MPU) of the system or a device reads and executes the program code stored in the storage. In this case, the function of an embodiment which the program code itself read from the storage mentioned above will be realized, and the storage which memorized that program code will constitute this invention. By executing the program code which the computer read, Based on directions of the program code the function of an embodiment mentioned above is not only realized, but, It cannot be overemphasized that it is contained also when the function of an embodiment which performed a part or all of processing that the operating system (OS) etc. which are working on a computer are actual, and was mentioned above by the processing is realized.
[0147]After the program code read from the storage was written in the memory with which the function expansion unit connected to the expansion card inserted in the computer or the computer is equipped, It cannot be overemphasized that it is contained also when the function of an embodiment which performed a part or all of processing that CPU etc. with which the expansion card and function expansion unit are equipped are actual, based on directions of the program code, and was mentioned above by the processing is realized.
[0148]
[Effect of the Invention]Since the data of the neighborhood of the time which could judge immediately whether it was data of the specified time in the search-results display, and was specified is displayed according to this invention also when has misunderstood as explained above, It becomes a hint of subsequent operation and the data for which it asks can be reached quickly.

[Translation done.]

* NOTICES *

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3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1]A device with which data stored by adding time information is searched, comprising:
A setting-out means to set up a search condition including designated time.
A 1st search means to search said data with a search condition set up by said setting-out means.
The 1st displaying means that displays a list of data searched by said 1st search means on a search-results viewing area.
A 2nd search means to search data stored by changing designated time included in said search condition, and adding said time information when data searched by said 1st search means did not exist, The 2nd displaying means that changes a display style in said search-results viewing area with said 1st search means, and displays data searched by said 2nd search means on it.

[Claim 2]The data retrieval equipment according to claim 1, wherein said 2nd displaying means drops and displays display luminance rather than a display by said 1st displaying means.
[Claim 3]Said 2nd search means is after designated time included in said search condition, The data retrieval equipment according to claim 1 setting new designated time as said search condition according to time information which searches data which has the time information nearest to this designated time, and searched data has, and searching data.
[Claim 4]Said 2nd search means searches data which has the time information nearest to this designated time among before and behind designated time included in said search condition, The data retrieval equipment according to claim 1 setting new designated time as said search condition according to time information which searched data has, and searching data.
[Claim 5]Said 2nd search means searches data which has the time information nearest to this designated time in each before and behind designated time included in said search condition, According to time information which searched data has, set new designated time as said search condition, search data, and said 2nd displaying means, While displaying data searched about each of said designated time front and the back by a different display style from said 1st displaying means by said 2nd search means, The data retrieval equipment according to claim 1 changing a display style and also displaying each data of this designated time front and the back.
[Claim 6]The data retrieval equipment comprising according to claim 1:
An acquisition means which acquires data which is further provided with a scroll means to scroll a list display of data in said search-results viewing area according to an input of scroll operation, and in which this scroll means should be displayed on a head position of said search-results viewing area based on the time information.
An alteration means which changes the appointed time on said search condition according to time information which acquired data has.
A control means as which said 1st search means and said 1st displaying means are operated using a search condition containing the appointed time changed by said alteration means.

[Claim 7]The data retrieval equipment according to claim 1 having further the 3rd displaying means that changes the display style into this remainder field, and displays on it data searched by said 2nd

search means when a field exists in said search-results viewing area not much as a result of data display by said 1st displaying means.
[Claim 8]The data retrieval equipment according to claim 7 having further said scroll means in which scroll operation is not much possible to a field.
[Claim 9]A method characterized by comprising the following of searching data stored by adding time information.
A setting-out process of setting up a search condition including designated time.
The 1st retrieval process that searches said data with a search condition set up at said setting-out process.
The 1st display process of displaying a list of data searched by said 1st retrieval process on a search-results viewing area in a display screen.
The 2nd retrieval process that searches data stored by changing designated time included in said search condition, and adding said time information when data searched by said 1st retrieval process did not exist, The 2nd display process of changing a display style in said search-results viewing area with said 1st retrieval process, and displaying data searched by said 2nd retrieval process on it.

[Claim 10]The data retrieval method according to claim 9, wherein said 2nd display process drops and displays display luminance rather than a display by said 1st display process.
[Claim 11]Said 2nd retrieval process is after designated time included in said search condition, The data retrieval method according to claim 9 setting new designated time as said search condition according to time information which searches data which has the time information nearest to this designated time, and searched data has, and searching data.
[Claim 12]Said 2nd retrieval process searches data which has the time information nearest to this designated time among before and behind designated time included in said search condition, The data retrieval method according to claim 9 setting new designated time as said search condition according to time information which searched data has, and searching data.
[Claim 13]Said 2nd retrieval process searches data which has the time information nearest to this designated time in each before and behind designated time included in said search condition, According to time information which searched data has, set new designated time as said search condition, search data, and said 2nd display process, While displaying data searched about each of said designated time front and the back by a different display style from said 1st display process according to said 2nd retrieval process, The data retrieval method according to claim 9 changing a display style and also displaying each data of this designated time front and the back.
[Claim 14]The data retrieval method comprising according to claim 9:
An acquisition process from which it has further a scroll process of scrolling a list display of data in said search-results viewing area according to an input of scroll operation, and this scroll process acquires data which should be displayed on a head position of said search-results viewing area based on the time information.
A change process of changing the appointed time on said search condition according to time information which acquired data has.
A control process which performs said 1st retrieval process and said 1st display process using a search condition containing the appointed time changed at said change process.

[Claim 15]The data retrieval method according to claim 9 having further the 3rd display process which changes the display style into this remainder field, and displays on it data searched by said 2nd retrieval process when a field exists in said search-results viewing area not much as a result of data display by said 1st display process.
[Claim 16]The data retrieval method according to claim 15 having further said scroll process in which scroll operation is not much possible to a field.
[Claim 17]A storage which stores a control program for a computer to realize a method according to any one of claims 9 to 16.

[Translation done.]

* NOTICES *

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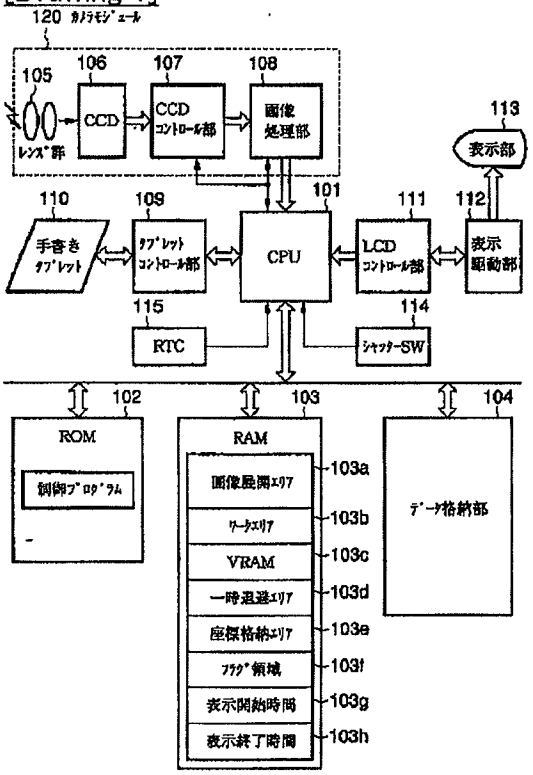
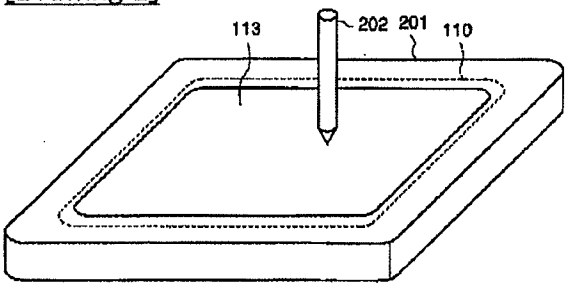
3.In the drawings, any words are not translated.

DRAWINGS

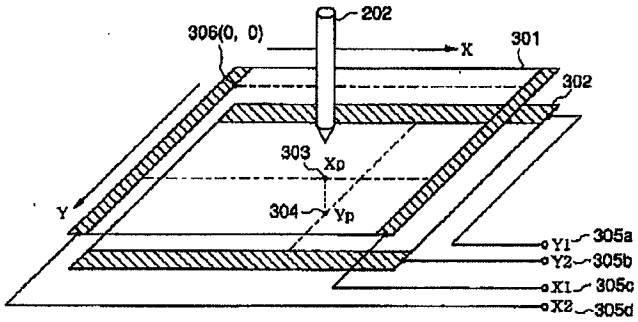
[Drawing 1]



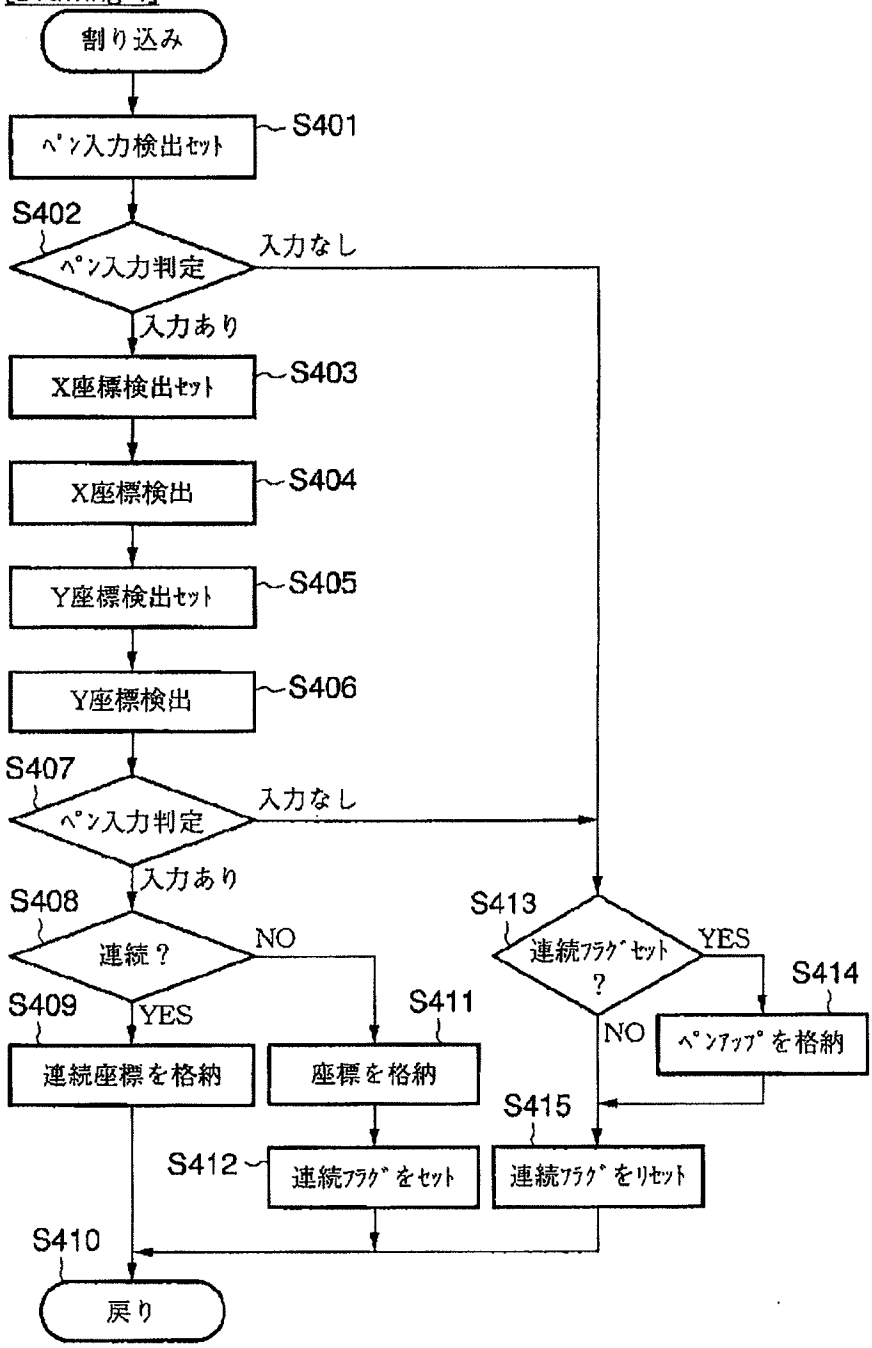
[Drawing 2]



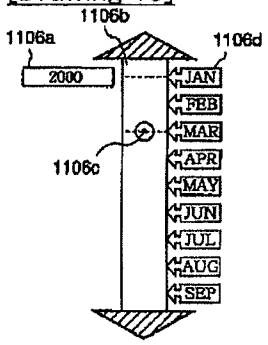
[Drawing 3]


202
306(0, 0)
X
301
302
303
Xp
304
Yp
Y
Y1 305a
Y2 305b
X1 305c
X2 305d

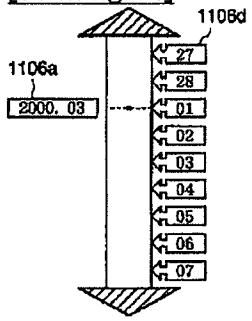
[Drawing 4]


割り込み
ペン入力検出セット
S401
S402
ペン入力判定
入力なし
入力あり
X座標検出セット
S403
X座標検出
S404
Y座標検出セット
S405
Y座標検出
S406
S407
ペン入力判定
入力なし
入力あり
S408
連続？
NO
YES
S409
連続座標を格納
S411
座標を格納
S412
連続フラグをセット
S413
連続フラグセット？
YES
NO
S414
ペンアップを格納
S415
連続フラグをリセット
S410
戻り

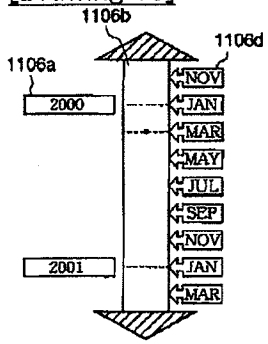
[Drawing 13]



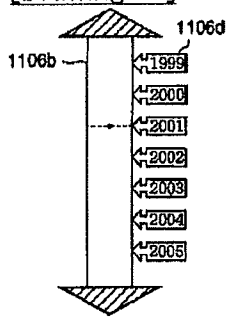
[Drawing 14]



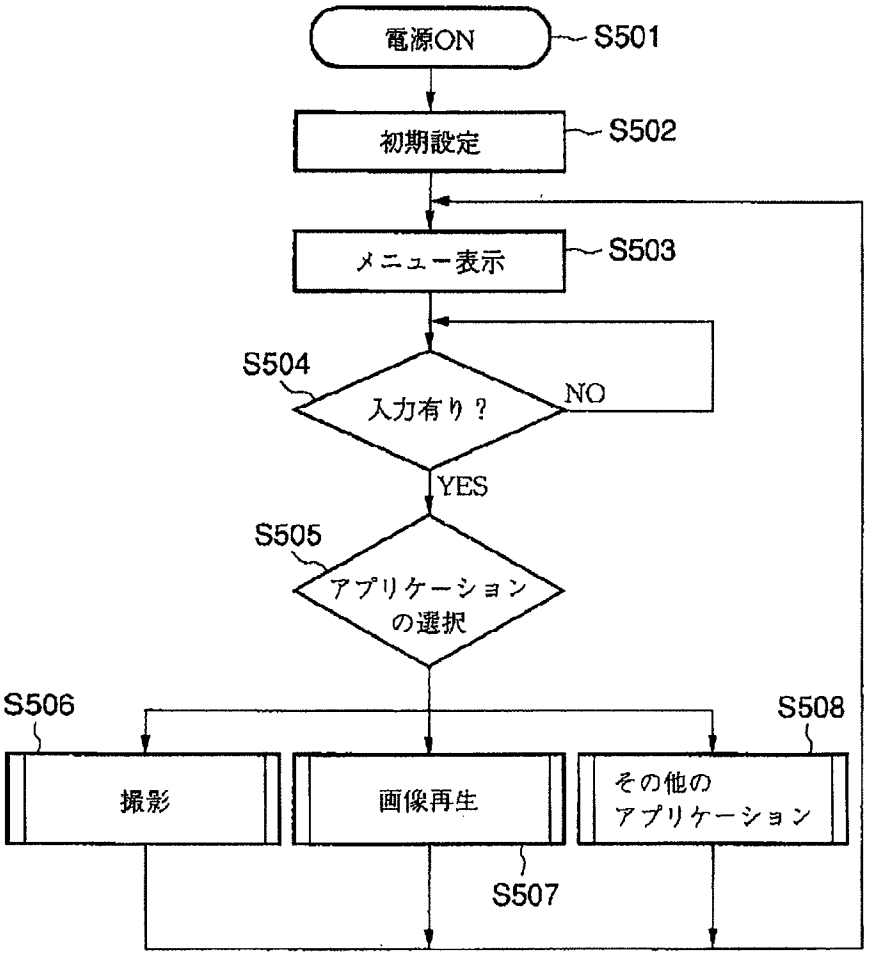
[Drawing 15]



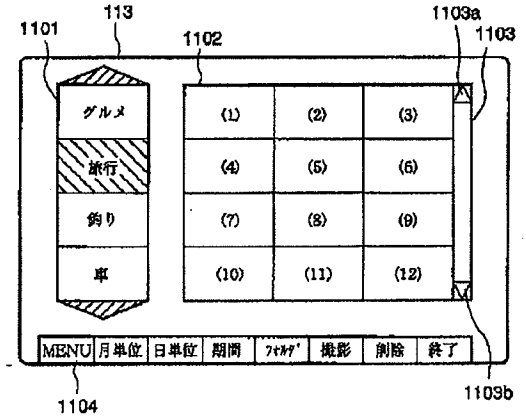
[Drawing 16]



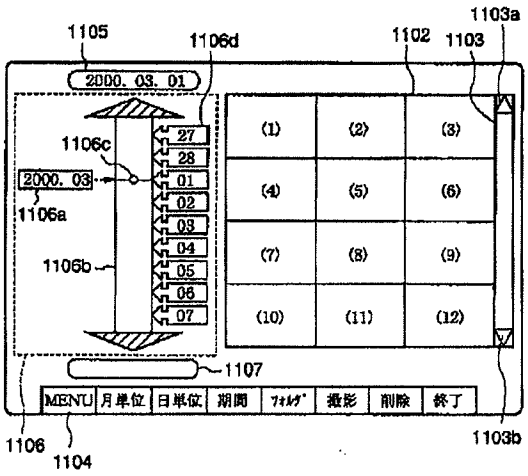
[Drawing 5]



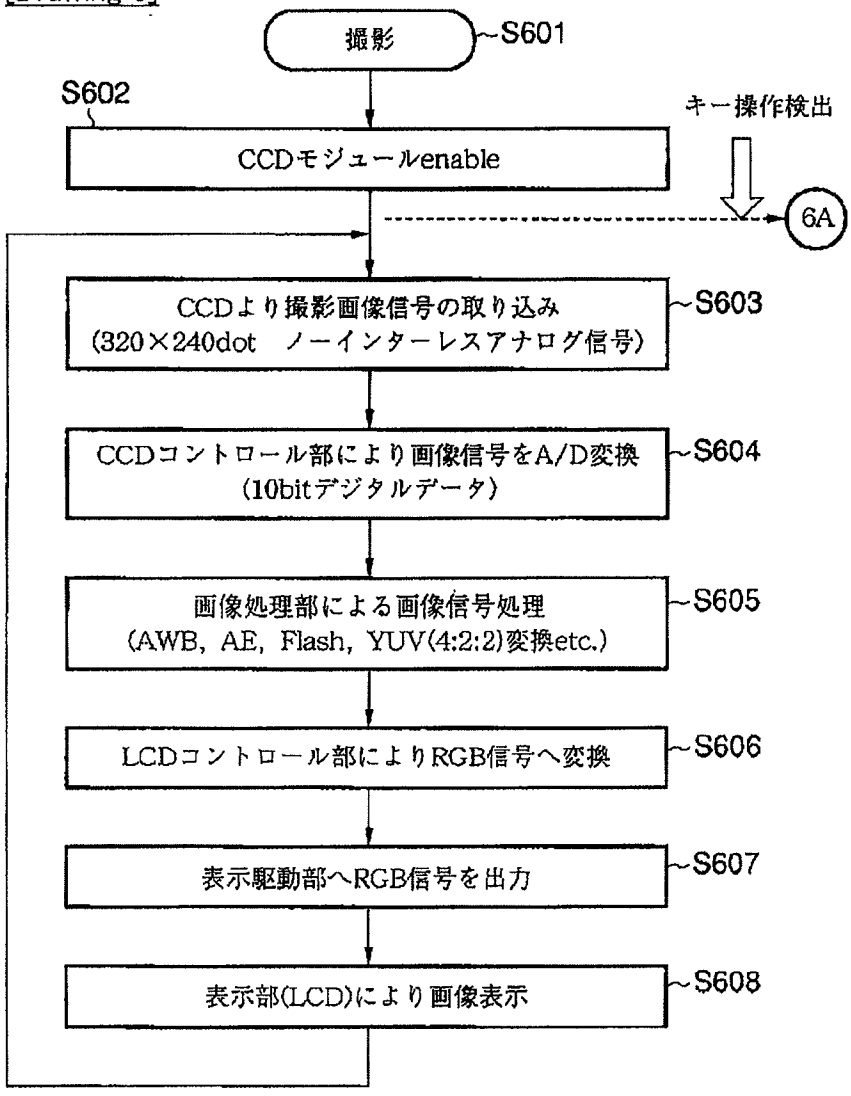
[Drawing 11]



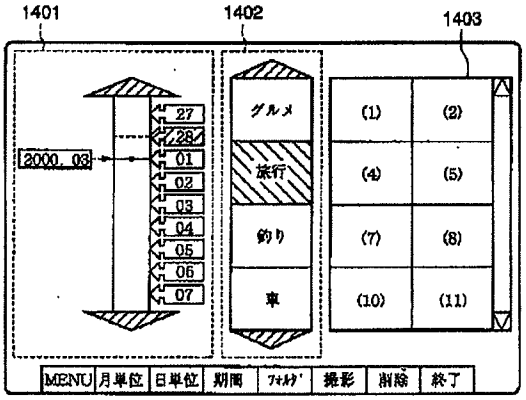
[Drawing 12]



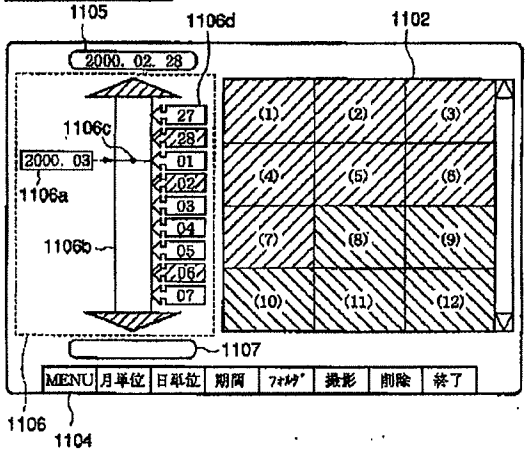
[Drawing 6]



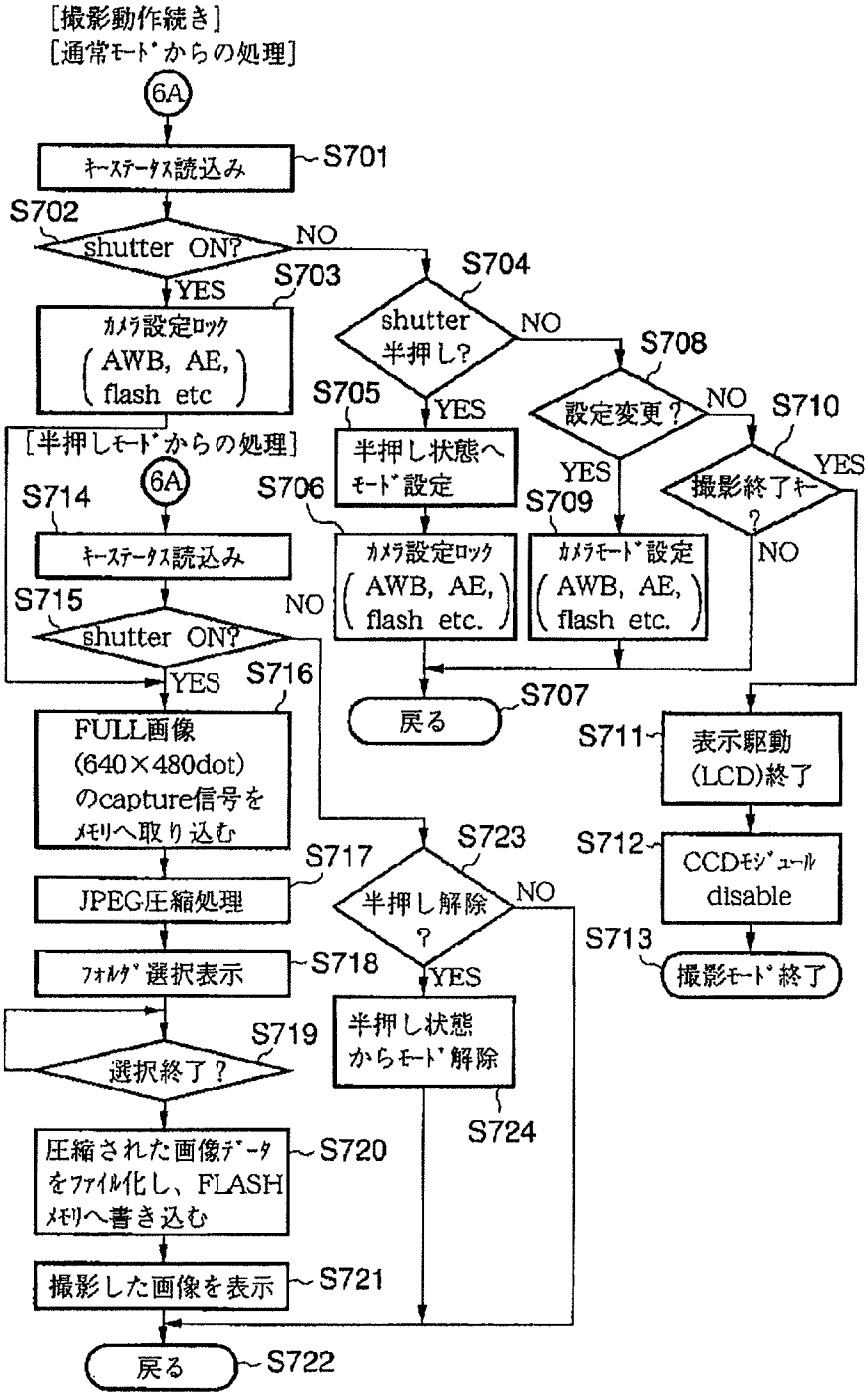
[Drawing 18]



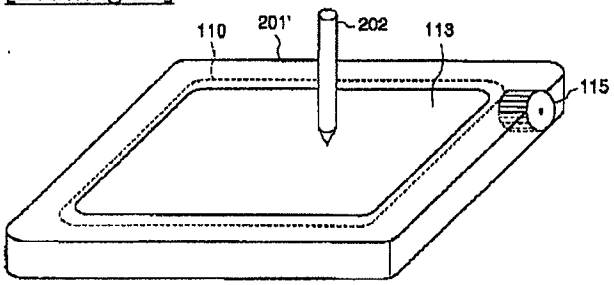
[Drawing 22]



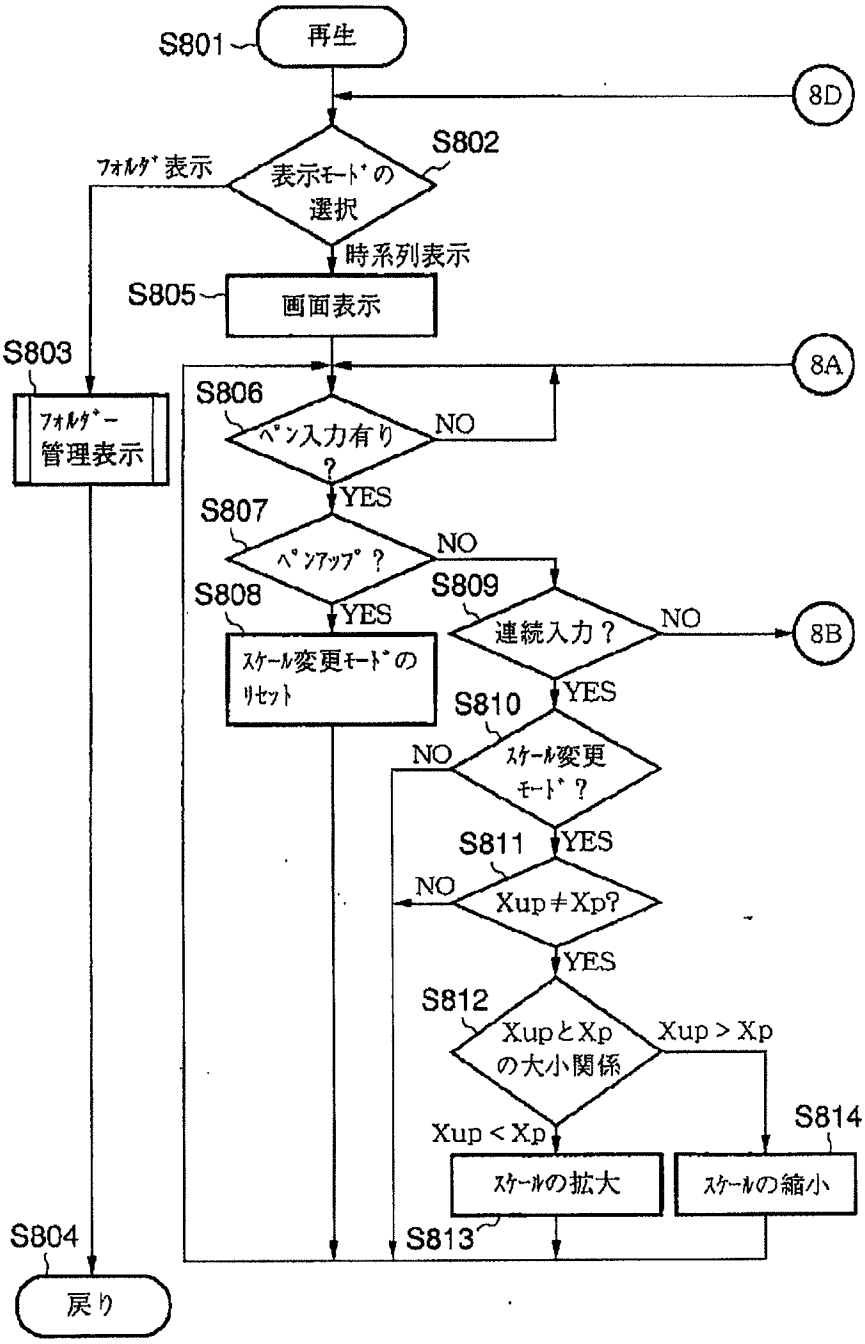
[Drawing 7]



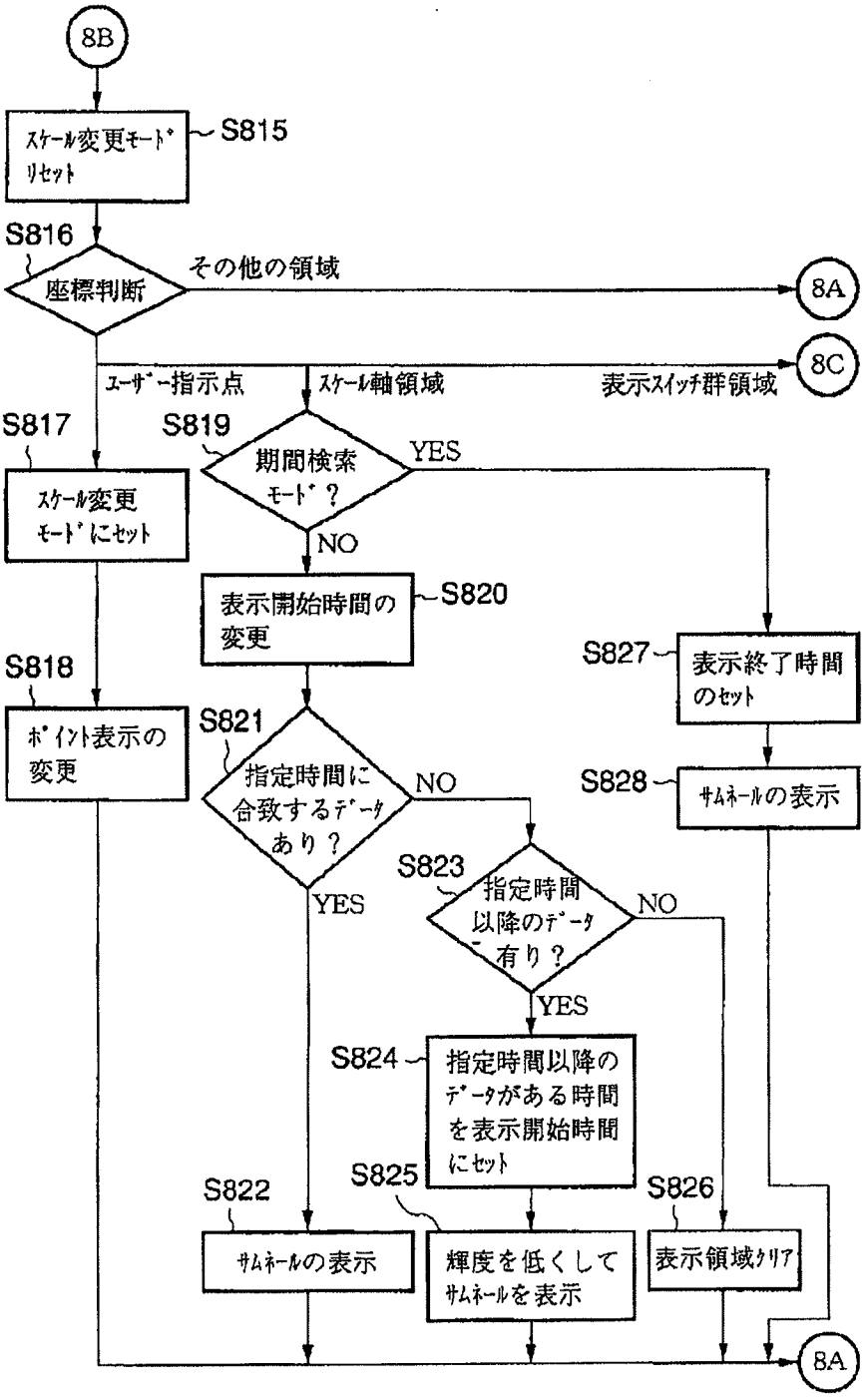
[Drawing 24]



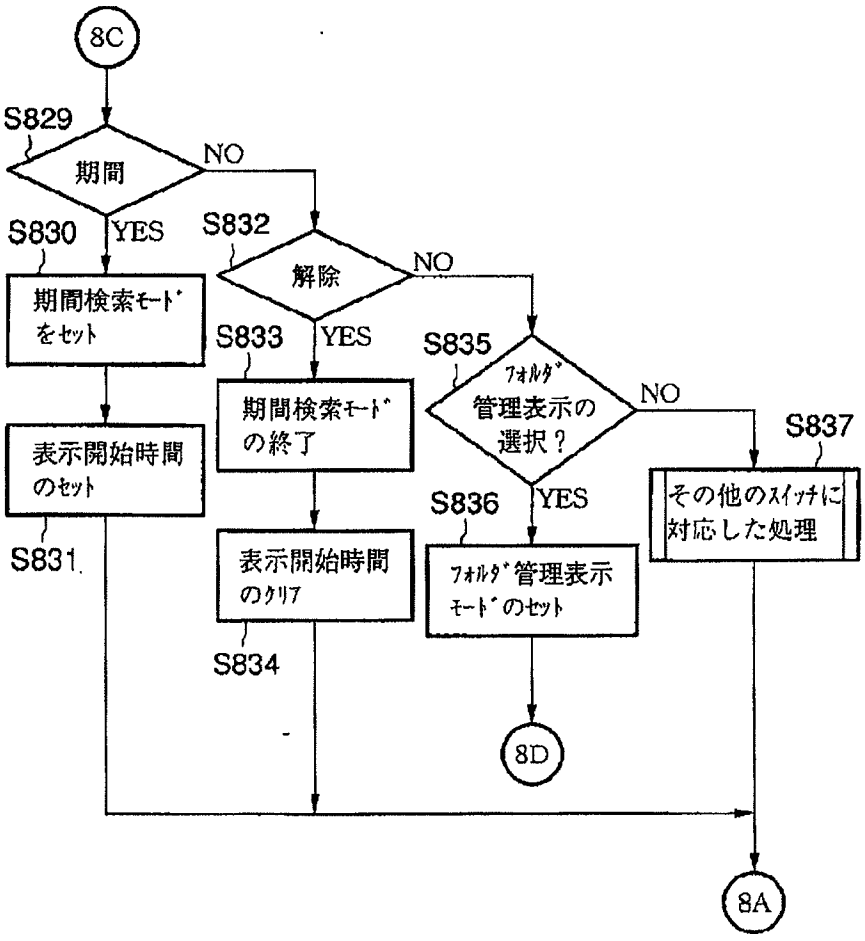
[Drawing 8]


S801
再生
8D
S802
表示ﾓｰﾄﾞの選択
ﾌｫﾙﾀﾞ表示
時系列表示
S805
画面表示
S803
ﾌｫﾙﾀﾞｰ管理表示
8A
S806
ﾍﾟﾝ入力有り？
NO
YES
S807
ﾍﾟﾝｱｯﾌﾟ？
NO
S809
S808
YES
連続入力？
NO
8B
ｽｹｰﾙ変更ﾓｰﾄﾞのﾘｾｯﾄ
S810
YES
NO
ｽｹｰﾙ変更ﾓｰﾄﾞ？
S811
YES
NO
Xup≠Xp?
YES
S812
XupとXpの大小関係
Xup > Xp
S814
Xup < Xp
ｽｹｰﾙの拡大
ｽｹｰﾙの縮小
S804
S813
戻り

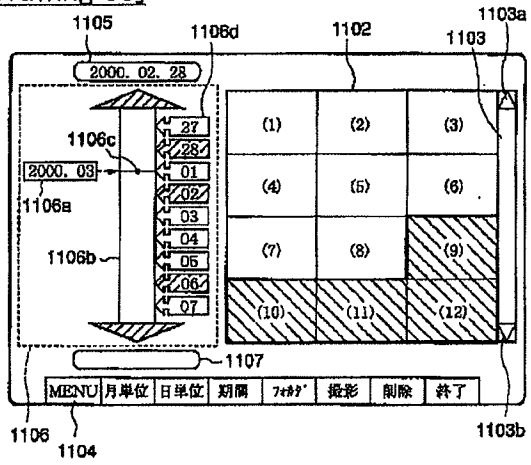
[Drawing 9]


8B
スケール変更モード リセット
S815
S816
座標判断
その他の領域
8A
8C
ユーザー指示点
スケール軸領域
表示スイッチ群領域
S817
S819
期間検索 モード？
YES
スケール変更 モードにセット
NO
表示開始時間の 変更
S820
S827
表示終了時間 のセット
S818
ポイント表示の 変更
S821
指定時間に 合致するデータ あり？
NO
S828
サムネールの表示
S823
指定時間 以降のデータ 有り？
NO
YES
YES
S824
指定時間以降の データがある時間 を表示開始時間 にセット
S822
S825
S826
サムネールの表示
輝度を低くして サムネールを表示
表示領域クリア
8A

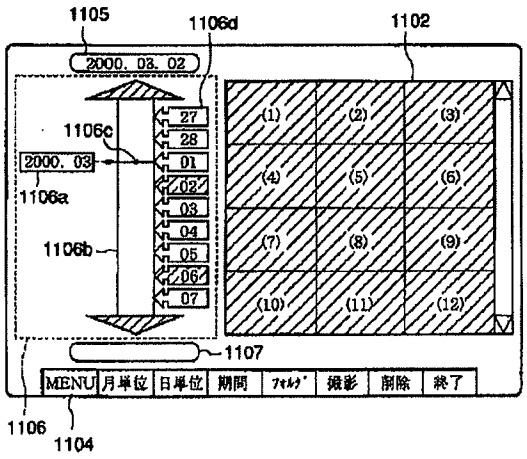
[Drawing 10]



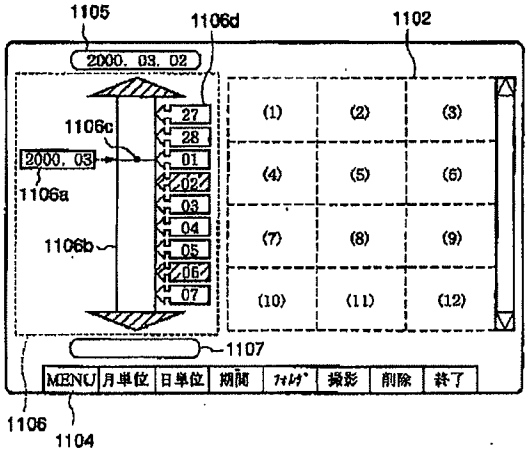
[Drawing 33]



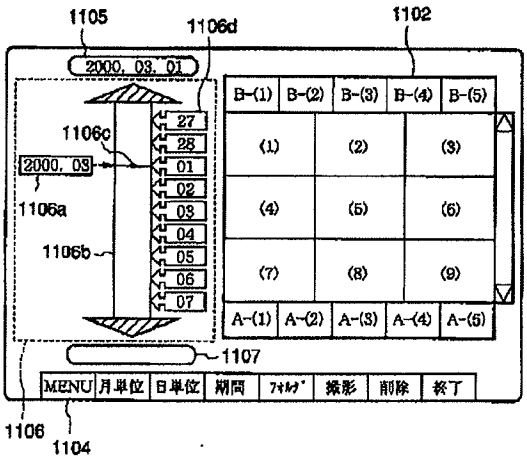
[Drawing 17]



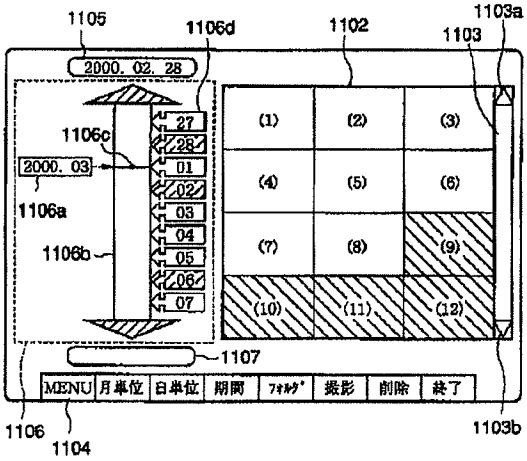
[Drawing 19]



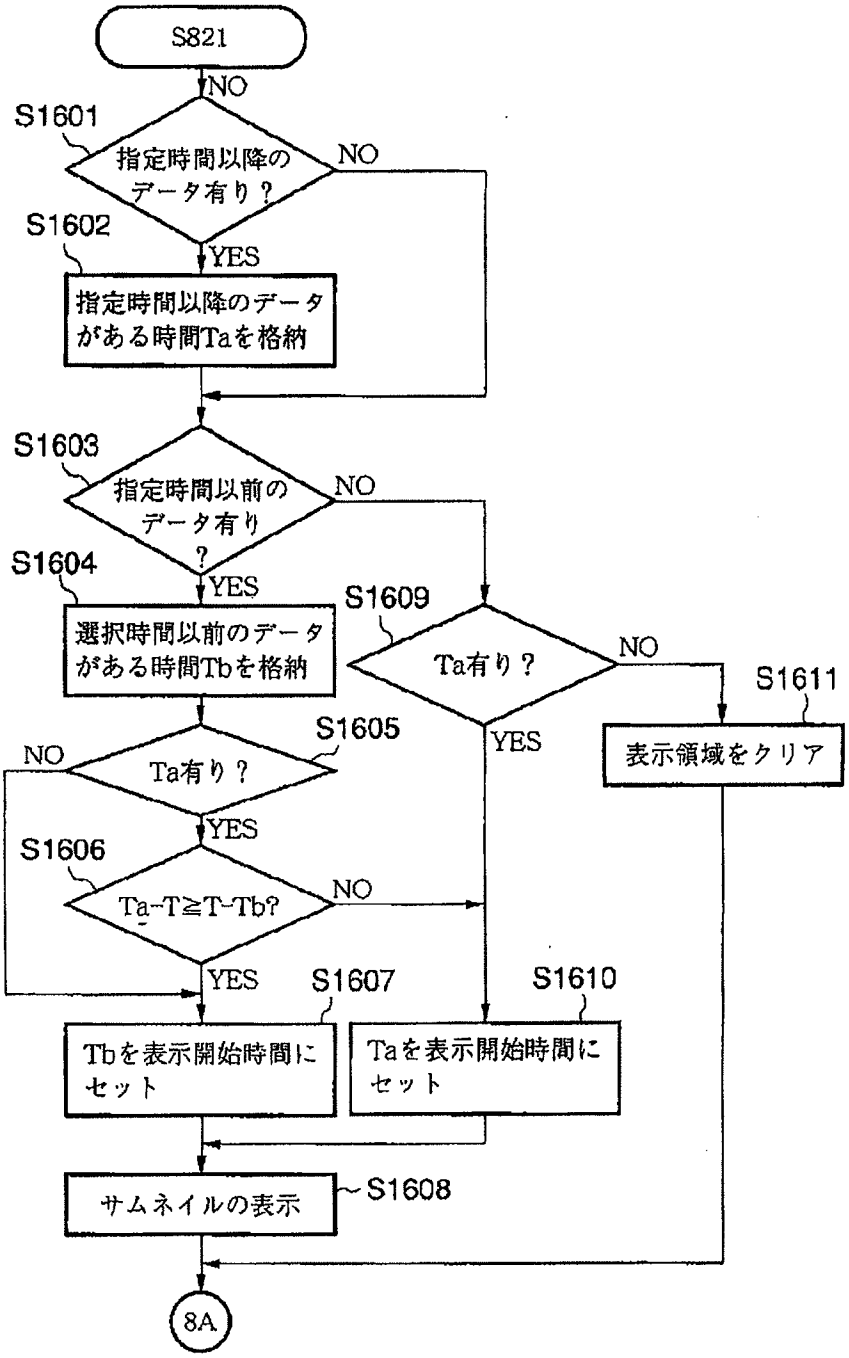
[Drawing 23]



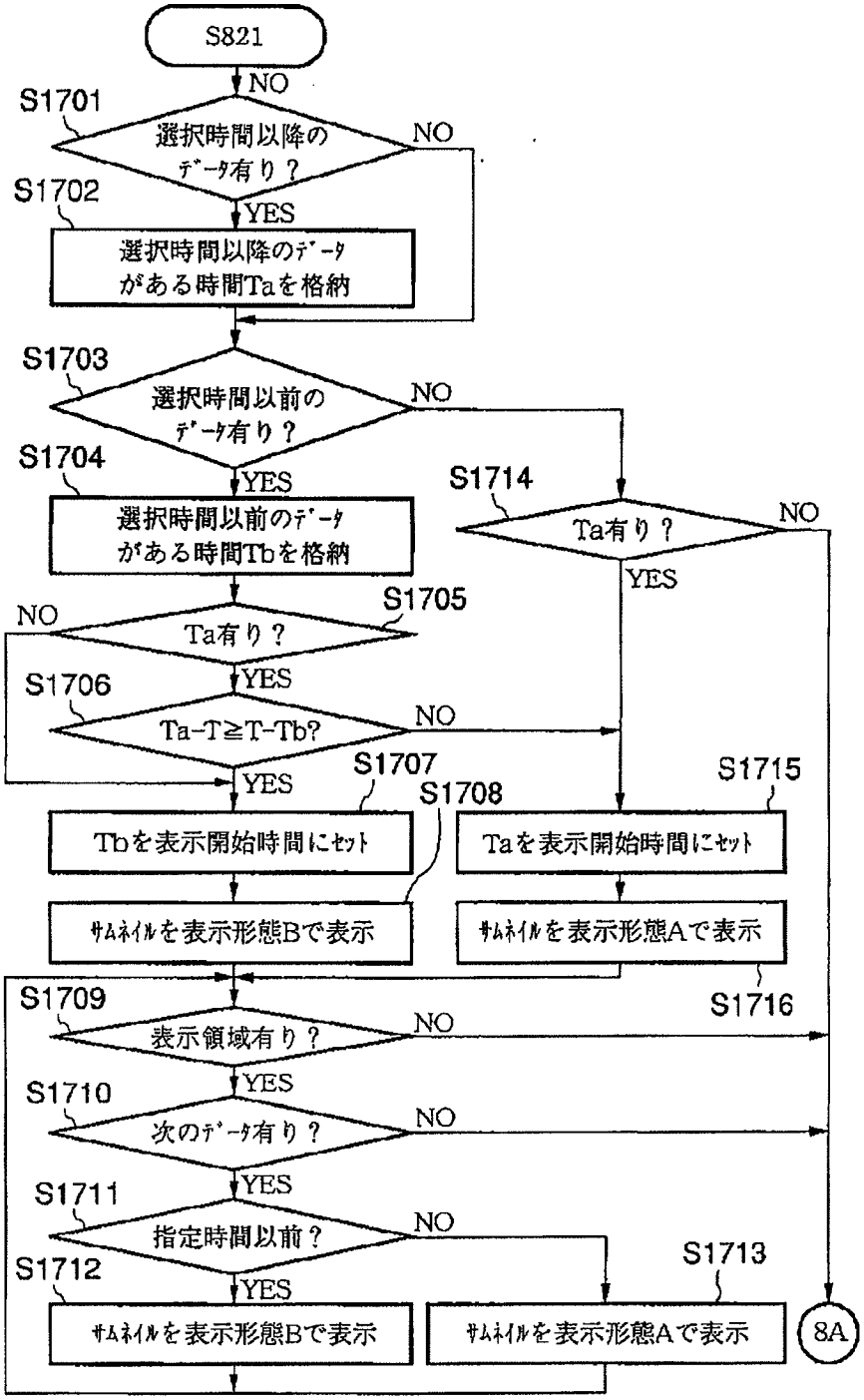
[Drawing 32]



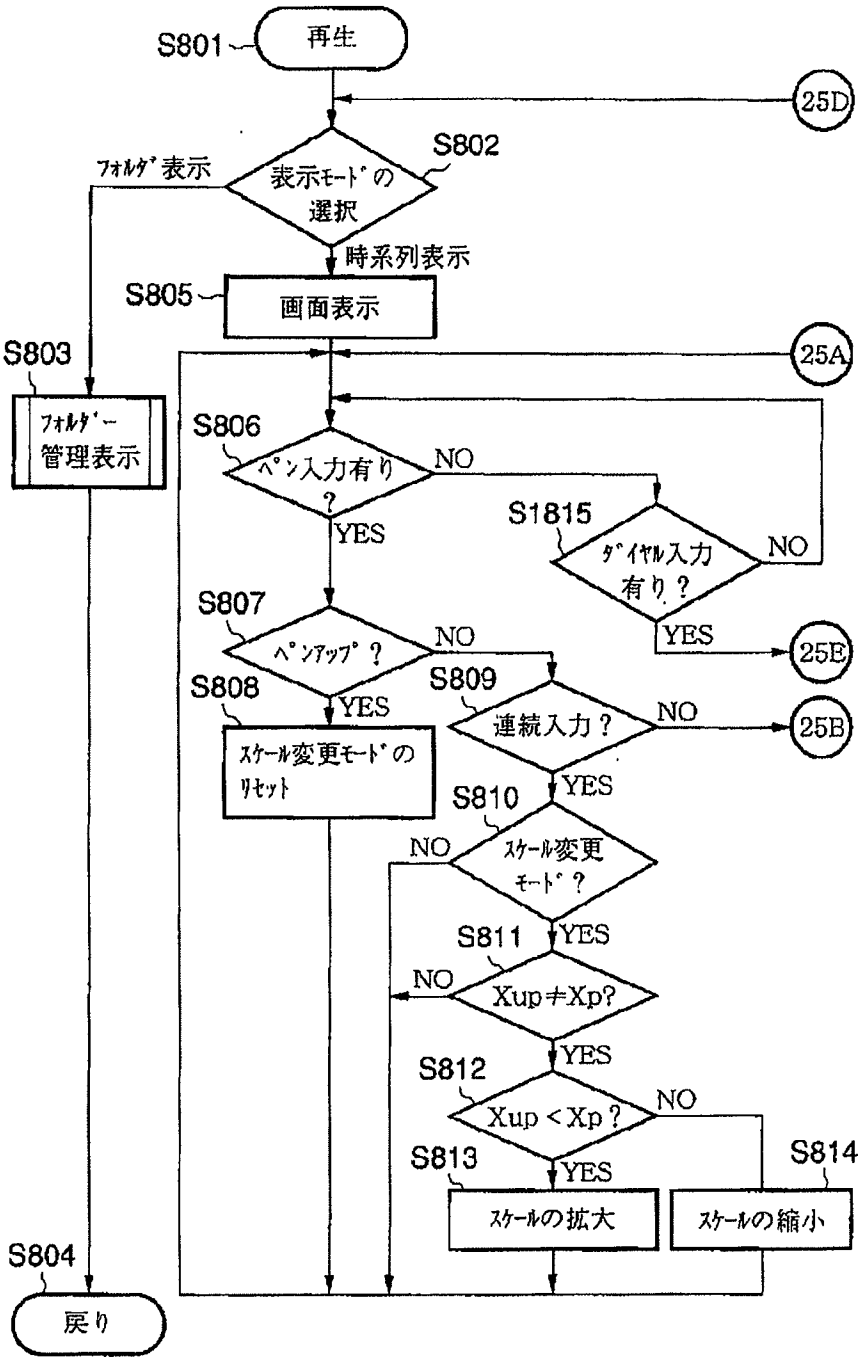
[Drawing 20]


S821
NO
S1601
指定時間以降のデータ有り？
NO
S1602
YES
指定時間以降のデータがある時間Taを格納
S1603
指定時間以前のデータ有り？
NO
S1604
YES
選択時間以前のデータがある時間Tbを格納
S1609
Ta有り？
NO
S1611
表示領域をクリア
YES
S1605
NO
Ta有り？
YES
S1606
Ta-T≧T-Tb?
NO
YES
S1607
Tbを表示開始時間にセット
S1610
Taを表示開始時間にセット
サムネイルの表示
S1608
8A

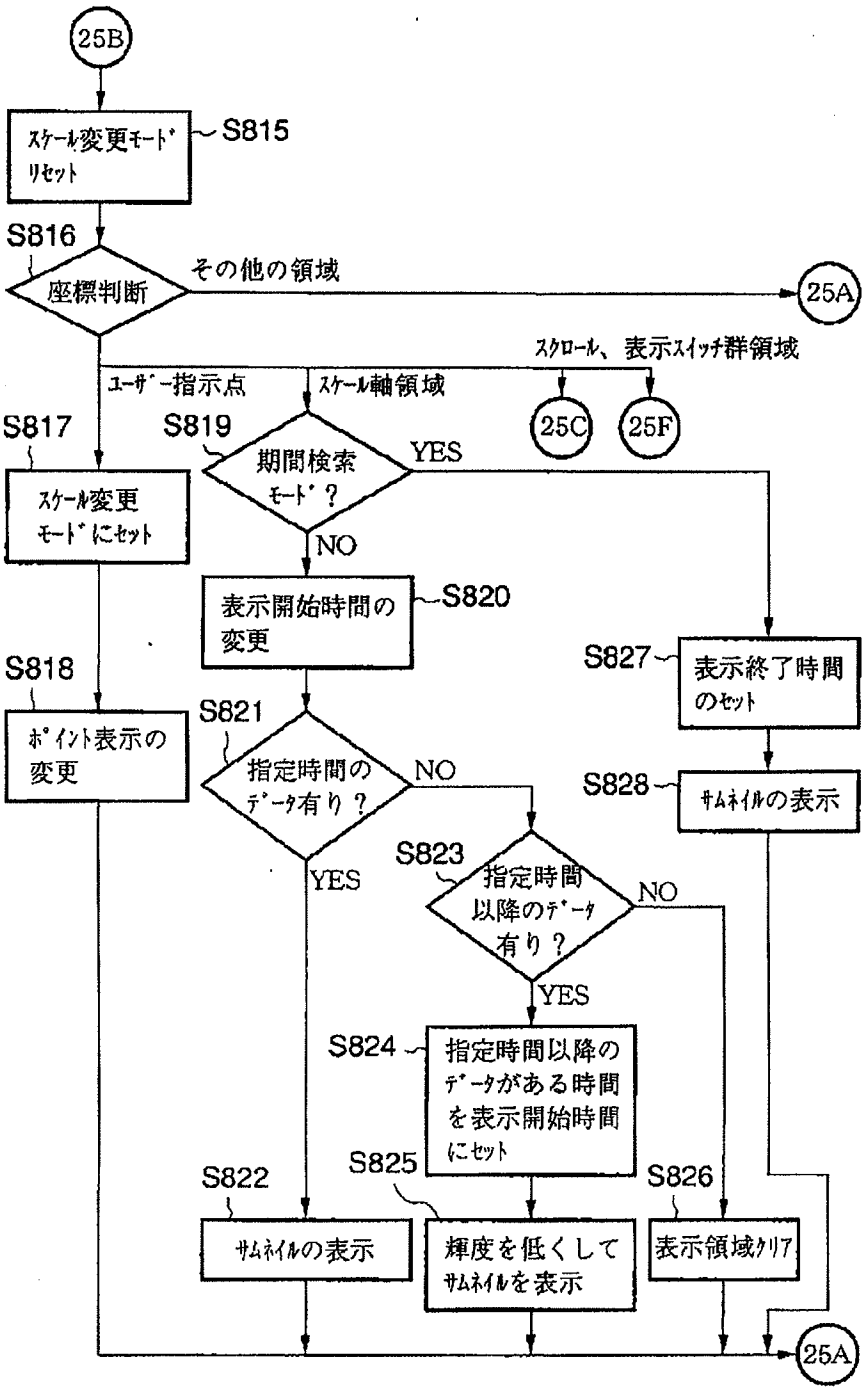
[Drawing 21]


S821
NO
S1701
選択時間以降のデータ有り？
NO
S1702
YES
選択時間以降のデータがある時間Taを格納
S1703
選択時間以前のデータ有り？
NO
S1704
YES
選択時間以前のデータがある時間Tbを格納
S1714
Ta有り？
NO
YES
NO
S1705
Ta有り？
YES
S1706
Ta-T≧T-Tb?
NO
YES
S1707
S1708
S1715
Tbを表示開始時間にセット
Taを表示開始時間にセット
サムネイルを表示形態Bで表示
サムネイルを表示形態Aで表示
S1716
S1709
表示領域有り？
NO
YES
S1710
次のデータ有り？
NO
YES
S1711
指定時間以前？
NO
S1713
S1712
YES
サムネイルを表示形態Bで表示
サムネイルを表示形態Aで表示
8A

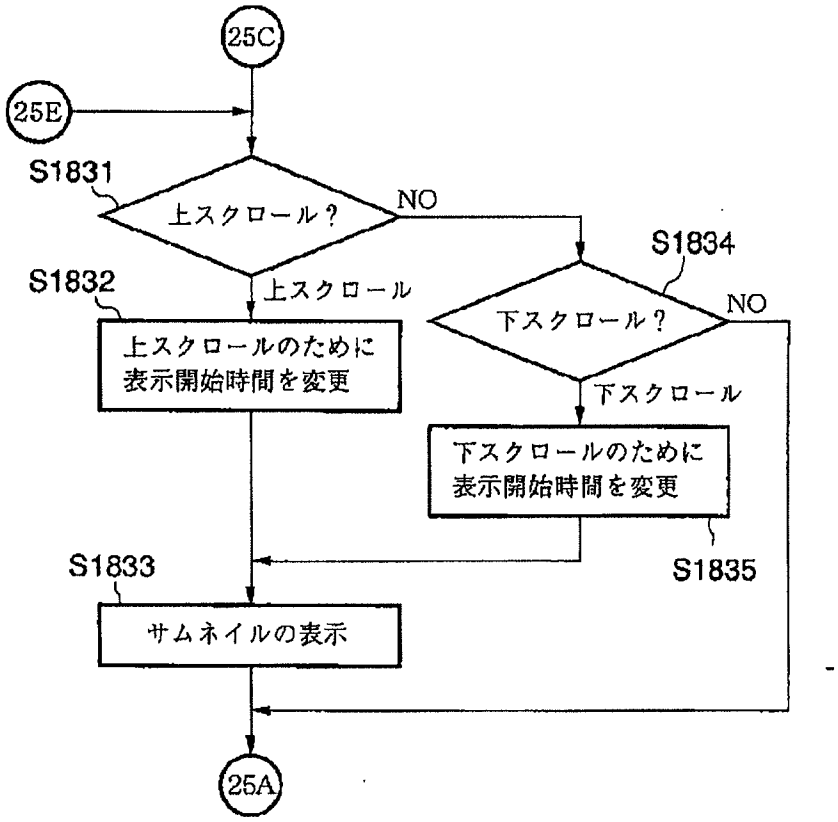
[Drawing 25]


S801
再生
25D
S802
表示ﾓｰﾄﾞの選択
ﾌｫﾙﾀﾞ表示
時系列表示
S805
画面表示
S803
ﾌｫﾙﾀﾞｰ管理表示
25A
S806
ﾍﾟﾝ入力有り？
NO
YES
S1815
ﾀﾞｲﾔﾙ入力有り？
NO
YES
25E
S807
ﾍﾟﾝｱｯﾌﾟ？
NO
YES
S808
ｽｹｰﾙ変更ﾓｰﾄﾞのﾘｾｯﾄ
S809
連続入力？
NO
25B
YES
S810
ｽｹｰﾙ変更ﾓｰﾄﾞ？
NO
YES
S811
Xup≠Xp?
NO
YES
S812
Xup < Xp ?
NO
YES
S813
ｽｹｰﾙの拡大
S814
ｽｹｰﾙの縮小
S804
戻り

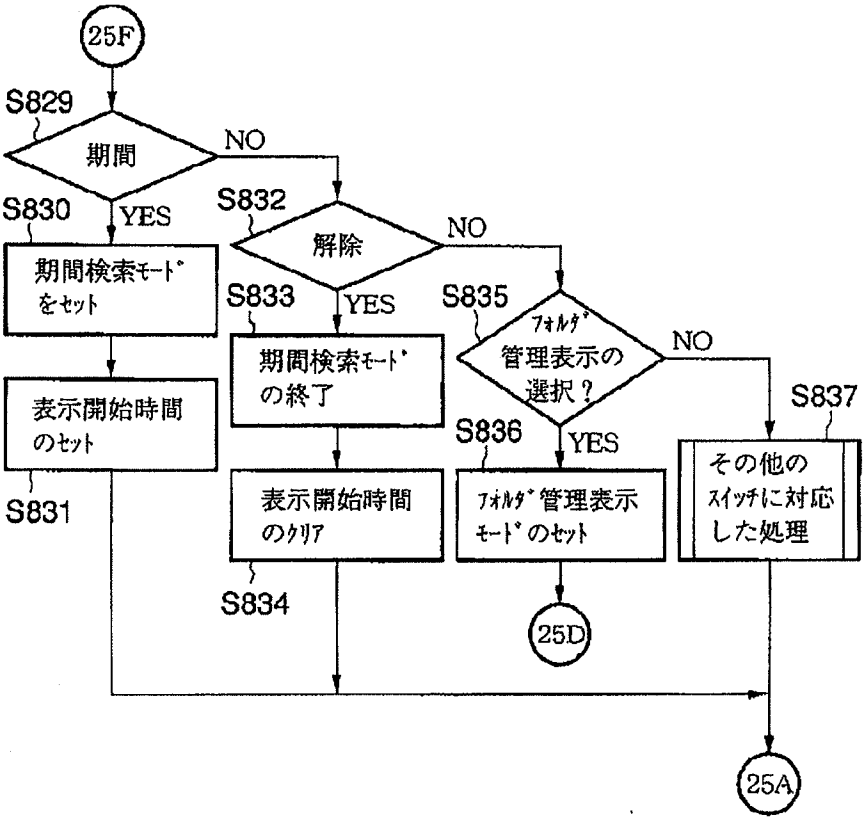
[Drawing 26]


25B
スケール変更モード リセット
S815
S816
座標判断
その他の領域
25A
スクロール、表示スイッチ群領域
ユーザー指示点
スケール軸領域
25C
25F
S817
S819
期間検索モード？
YES
スケール変更モードにセット
NO
表示開始時間の変更
S820
S827
表示終了時間のセット
S818
ポイント表示の変更
S821
指定時間のデータ有り？
NO
S828
サムネイルの表示
S823
指定時間以降のデータ有り？
NO
YES
S824
指定時間以降のデータがある時間を表示開始時間にセット
S822
S825
S826
サムネイルの表示
輝度を低くしてサムネイルを表示
表示領域クリア
25A

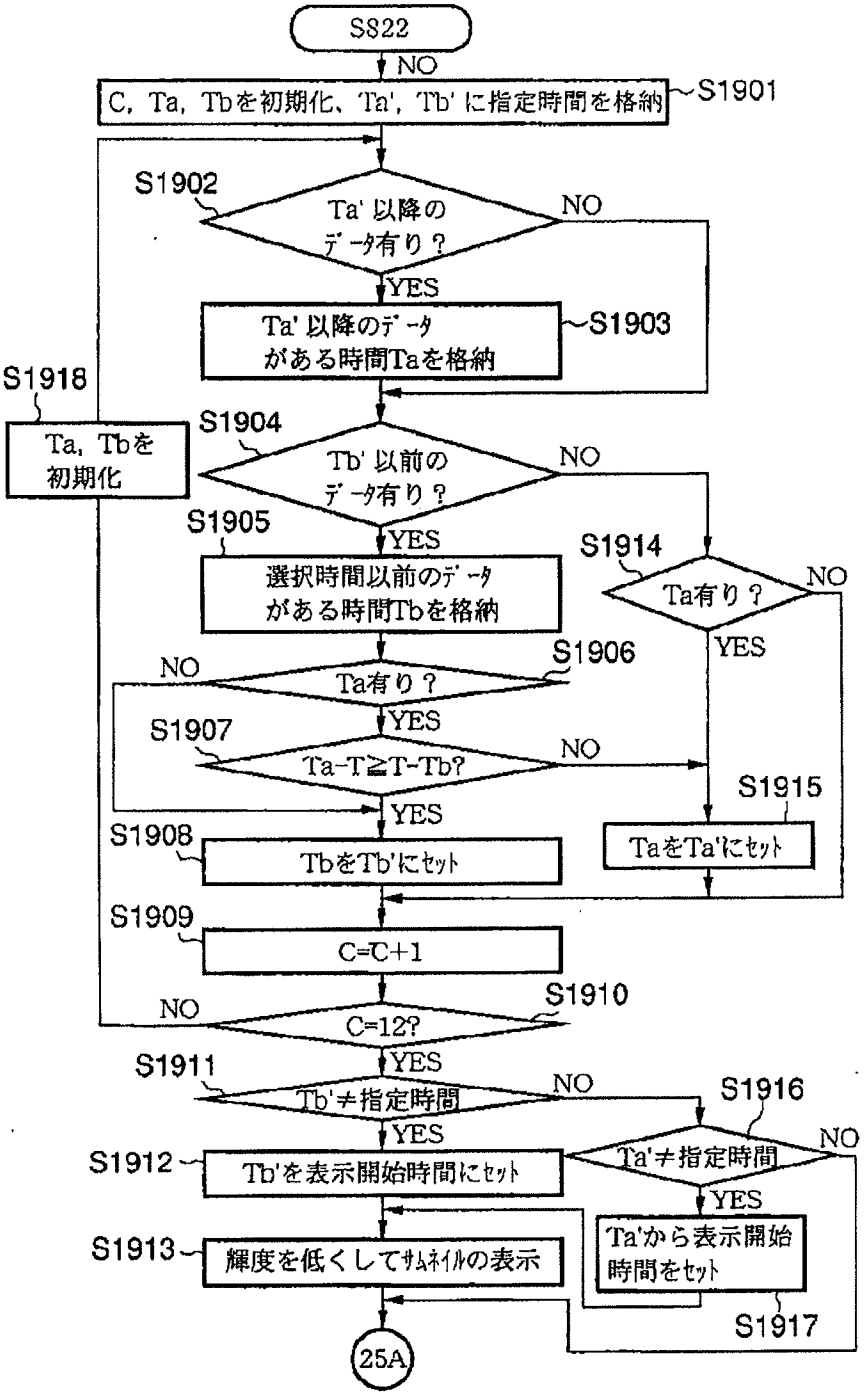
[Drawing 27]


25C
25E
S1831
上スクロール？
NO
S1834
S1832
上スクロール
下スクロール？
NO
上スクロールのために
表示開始時間を変更
下スクロール
下スクロールのために
表示開始時間を変更
S1833
S1835
サムネイルの表示
25A

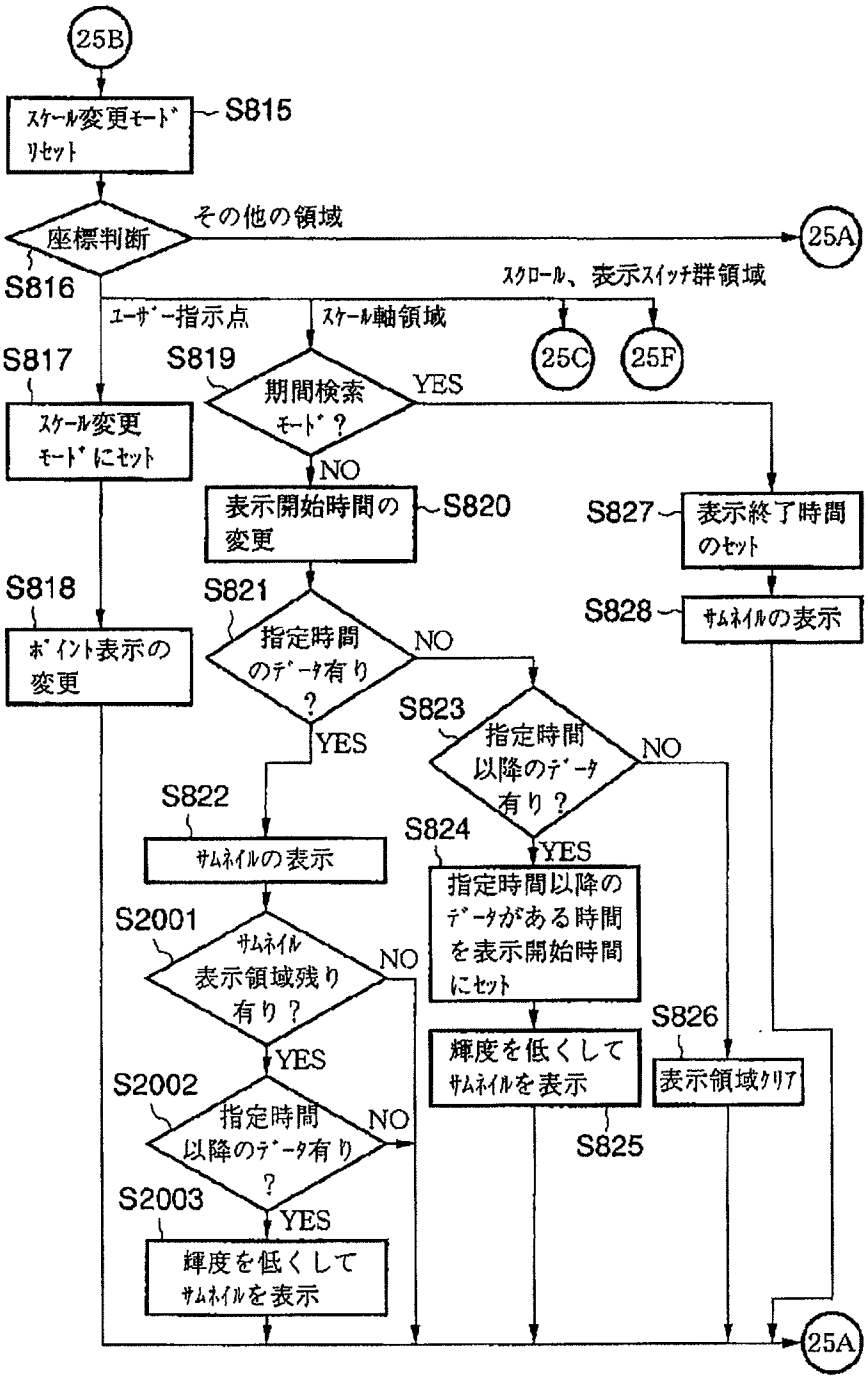
[Drawing 28]


25F
S829
期間
NO
YES
S830
期間検索ﾓｰﾄﾞをｾｯﾄ
表示開始時間のｾｯﾄ
S831
S832
解除
NO
YES
S833
期間検索ﾓｰﾄﾞの終了
表示開始時間のｸﾘｱ
S834
S835
ﾌｫﾙﾀﾞ管理表示の選択？
NO
YES
S836
ﾌｫﾙﾀﾞ管理表示ﾓｰﾄﾞのｾｯﾄ
25D
S837
その他のｽｲｯﾁに対応した処理
25A

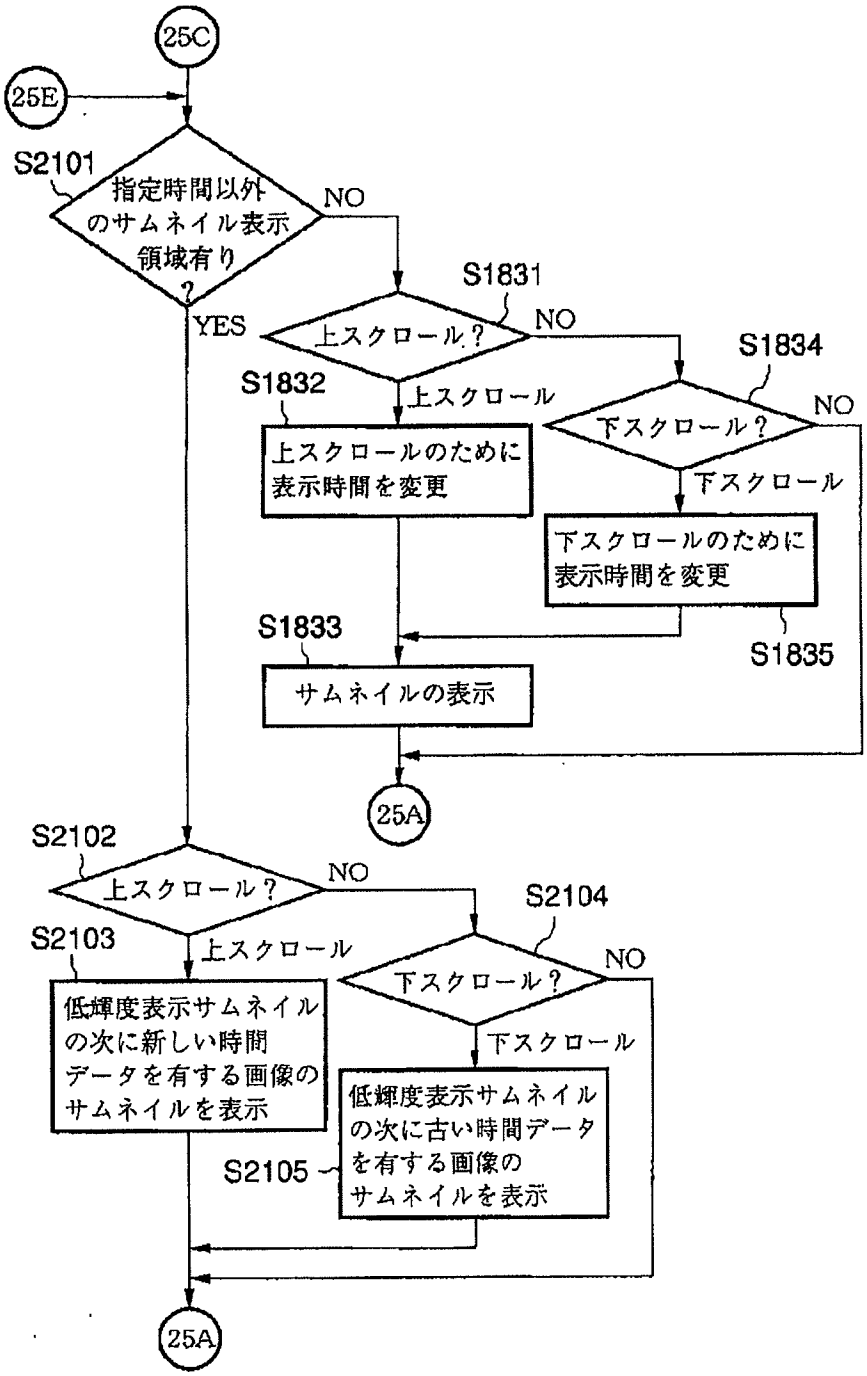
[Drawing 29]


S822
NO
C, Ta, Tbを初期化、Ta', Tb' に指定時間を格納
S1901
S1902
Ta' 以降のデータ有り？
NO
YES
Ta' 以降のデータがある時間Taを格納
S1903
S1918
Ta, Tbを初期化
S1904
Tb' 以前のデータ有り？
NO
YES
S1905
選択時間以前のデータがある時間Tbを格納
S1914
Ta有り？
NO
YES
NO
S1906
Ta有り？
YES
S1907
Ta-T≧T-Tb?
NO
YES
S1915
TaをTa'にセット
S1908
TbをTb'にセット
S1909
C=C+1
S1910
NO
C=12?
YES
S1911
Tb'≠指定時間
NO
YES
S1916
Ta'≠指定時間
NO
YES
S1912
Tb'を表示開始時間にセット
S1913
輝度を低くしてサムネイルの表示
Ta'から表示開始時間をセット
S1917
25A

[Drawing 30]


25B
スケール変更モード リセット
S815
座標判断
その他の領域
25A
S816
スクロール、表示スイッチ群領域
ユーザー指示点
スケール軸領域
25C
25F
S817
S819
期間検索モード？
YES
スケール変更モードにセット
NO
表示開始時間の変更
S820
S827
表示終了時間のセット
S818
S821
S828
サムネイルの表示
ポイント表示の変更
指定時間のデータ有り？
NO
S823
指定時間以降のデータ有り？
NO
YES
S822
S824
サムネイルの表示
YES
指定時間以降のデータがある時間を表示開始時間にセット
S2001
サムネイル表示領域残り有り？
NO
S826
輝度を低くしてサムネイルを表示
表示領域クリア
YES
S2002
S825
指定時間以降のデータ有り？
NO
S2003
YES
輝度を低くしてサムネイルを表示
25A

[Drawing 31]



[Translation done.]